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# MONTHLY REPORT

OF THE

# DEPARTMENT OF AGRICULTURE

FOR

## MARCH AND APRIL, 1872.

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# MONTHLY REPORT.

DEPARTMENT OF AGRICULTURE,
*Statistical Division, April 26, 1872.*

SIR: I submit herewith, for publication, a digest of the reports of our statistical corps, relative to the condition of winter-wheat and other cereals, the condition of farm animals, and the comparative prevalence of disease among them during the past year, with a communication giving an account of the progress of the beet-root sugar manufacture in Sweden, and records of the operations of the several Divisions of the Department.

J. R. DODGE, *Statistician.*

Hon. FREDERICK WATTS,
*Commissioner.*

## CONDITION OF WINTER GRAIN.

The low temperature of the month of March, and the accumulations of winter snow and ice, have retarded the springing of vegetable life, and tinged with gloom the views of local reporters. Over a large area, at the date of returns, snow still covered deeply the grain-fields, and only conjecture, founded on the forwardness and vigor of plants at the opening of winter, and on the mechanical condition of the soil and the severity of the season, could point to the probable *status* of the winter grain. The general tenor of reports carries the idea, not of sweeping destruction by freezing, but of injury by thinning out, by killing in spots and patches, and especially by retarding an early start and vigorous growth. In many cases the plants, apparently dead, were only sleeping, unpromising in appearance but firmly rooted, and ready, with favoring warmth and sunshine, to start into sure and steady if not rapid growth. Where the fields were drained, the soil deep and mellow, the casualties of winter have been unknown; where the seeding was done with the drill, on land having any fair degree of suitable preparation, almost absolute immunity from loss by freezing has been secured. It is strange that the use of the drill has not become universal. The fact remains that nearly all the wheat of the Eastern States, almost all in the South, much in the Middle States, and no little in all portions of the Western, is seeded by hand. The use of drills enough to supersede all the broadcast sowing of the country would secure in a single year increased yield sufficient to pay for them.

The April returns, as a whole, indicate stunted appearance, retarded growth, and rather more than an average amount of destruction by winter-killing, but a sound condition of the roots of plants in suitable soil or that covered uniformly with snow, which with favoring weather may

secure a vigorous growth and a good yield. The droughts of summer always interfere, in a larger or smaller portion of the wheat area, with the proper time for seeding; those of last season were only a little more extended and severe than usual. Our climate is peculiarly subject to them, and this fact should enforce the more general draining, deepening, and mellowing of the surface soil, which alone, in the experience of the past, as reported each spring from almost every county in the country, would suffice to insure against the worst effects of drought upon our winter grain.

In Maine the ground was deeply covered with snow; but it was believed that the plants were safe. In Aroostook County an interest in winter grain is arising, as the result of a few good crops of winter-wheat last year. The snow was deep in New Hampshire on the 1st of April; the earth frozen, in the locality of our Hillsborough correspondent, "to the depth of seven feet." The small area reported in Vermont was generally promising when last seen in the autumn. In Massachusetts some reports of winter-killing are received. The few fields of wheat near Providence, Rhode Island, are flourishing; but rye is injured by freezing, the ground having been bare most of the winter; and rye in Kent County has been roughly treated by the winter winds of February and March, which have been unusually high. In Connecticut there has been much bare surface and severe weather, and the rye-fields present a somewhat unpropitious appearance. The reports are more favorable from Hartford than from Fairfield, Windham, and New London.

The reports from New York in the early part of the month were not very cheerful in tone, the snow and ice not having disappeared, but indicated a probable improvement, under the influences of fine weather, the plants being generally alive. A few extracts from correspondence will illustrate these points:

*Niagara:* Very poor; so dry last fall that but little growth was made except on the best prepared land. *Dutchess:* Look badly now; little snow. *Genesee:* The wheat was small when winter commenced, and has been uncovered most of the time; the top looks dead, but there is probably vitality enough in the roots to give a fair promise with favorable weather. *Chenango:* Below average; little protection from snow. *Sullivan:* Scarcely any winter-wheat; rye looks very bad; little snow to cover it. *Yates:* Wheat-fields are very bare now, but the roots seem to be generally alive. The fall was extremely dry, so that it got a poor start, and there has been no snow to protect it. *Seneca:* Never looked worse; top entirely dead. *Monroe:* Looks poor; cold winter and little snow. *Jefferson:* The ground was frozen hard in December, and afterward a partial thaw settled the snow down into a hard icy crust, which has since remained on the ground; hence the prospect is not very promising. *Erie:* Small on account of drought in the fall. *Albany:* Rather poor, having been exposed for three months to searching winds; but the hardest time is yet to come from freezing and thawing. *Chautauqua:* Badly frozen; and looks bleached, owing to cold winds without much snow. *Onondaga:* Wheat got a light growth in the fall, and has been mostly covered with snow since. *Steuben:* Severe cold and little snow has been hard on wheat and rye; the Fultz wheat looks better than any other, and promises to be an acquisition. *Washington:* Ground frozen more than two feet deep, and has been solidly frozen all winter; now covered with snow. *Livingston:* Wheat not looking well; steady cold with little snow; the ground frozen very deep. *Greene:* Looks rather poor. The ground has not been covered with snow a whole week during the entire winter; the coldest weather was in March, accompanied with high north

winds. *Queens:* Under snow; the river still frozen one foot thick, and used as a highway; good sleighing in some parts of the county. *Oneida:* Winter grains are now covered by one to two feet of snow, and the winter has been steadily cold. *Ontario:* Poorest condition known for thirty years, owing to absence of snow and freezing and thawing. *Ulster:* No snow; but the ground frozen four feet deep, with an occasional surface thaw. *Schuyler:* Very bad; the ground was very dry last fall, so that the plants got a poor start, and the winds blew the earth from the roots, there being little snow to protect them. There was but one fall of snow of over six inches in depth, and that remained upon the ground only four days. *Rensselaer:* Wheat, rye, clover, and timothy all appear to be dead, though we hope it may turn out better than that. It has been the hardest winter for seventy years. One-third of the potatoes frozen, and two-thirds of the bees dead. The heaviest teams crossed the river at Albany, the ice being three feet thick. Ground frozen from three and a half to five feet deep.

Most of the New Jersey returns represent the ground poorly covered with snow, while the temperature was low and the soil deeply frozen. In Morris County winter-grain was "much injured by freezing and thawing;" in Burlington "few fields have an average appearance, while many look worse than for seven years past;" in Cumberland the "plants had a good start in the fall, are well rooted, but as yet look bad;" in Camden "winter commenced in November, with very high winds, which seemed to kill the tops of the grain, and there was but little snow to protect it, so that little evidence of vitality appears, except in protected situations or fields early sown;" in Hunterdon, as the result of freezing, "many farmers contemplate plowing their fields for corn and oats when the weather permits;" in Union, where the ground was reported to be frozen to the depth of 30 inches at the date of the report, the appearance of wheat and rye fields is bad; and similar reports come from Hudson and Essex, where high winds have prevailed, with little snow. The fly has been busy in Warren and Burlington. The latter report says: "I have frequently found as many as four in a single stalk. Of course here, as elsewhere, the fly does most harm where neither the soil nor farmer supply the plant with the food necessary for vigorous growth. Much of the soil in the wheat-growing portion of our county is of that texture which best withstands the effects of a winter like that just past, (will not blow when dry; will not run when freezing and thawing,) and a favorable spring may yet give us a crop on this soil. Rye is grown on our lightest soil, and will bear a higher mark than wheat."

The reports from Pennsylvania refer to the severity of the winter and the depth of freezing; in some cases 2½ feet, in others 4 feet, at the date of mailing. There was "constant freezing from November 23 to April 1" in Cambria, and "fields that were green in fall are now bare;" "fields look as if scorched by fire" in Westmoreland; fields are injured by the fly and by frost in Lancaster; winter-wheat in Dauphin "has the appearance of having been frozen off, as the stem in many places can be lifted from the roots;" small growth was made in the fall in Bradford; looks poor in Cumberland, "but roots are living and commencing to grow;" much winter-killed in Mifflin, where a very large crop was grown last year, half of it the Fultz variety. Similar reports come from Wayne, York, Perry, Clinton, Chester, Tioga, Bucks, Indiana, Elk, Beaver, Susquehanna, Greene, Armstrong, Lawrence, Lycoming, Huntingdon, Mercer, Wyoming, Adams, Warren, Northumberland, Washington, and Lehigh. The fly is reported in several counties.

Lack of winter protection caused severe injury in Delaware.

South of Maryland and Virginia little wheat is grown, and rye mainly for winter pastures. A selection from returns will represent the condition of winter grain:

MARYLAND.—*Queen Anne:* The winter has been very hard on wheat, the growing season of last fall having ceased on the 1st of December. Fertilizers were very extensively used, and wheat seeded on or before October 10, with a liberal supply of fertilizer, and on properly drained land, has made a rapid improvement within the last few days, and now looks quite promising. When ground was not properly drained, or wheat seeded late, it still presents a poor appearance. It may not, however, be so badly hurt as its present apparent condition would seem to indicate, as the season is very backward, and the best wheat is no further advanced than it should have been by March 1st after passing through an ordinary winter. I will add that the Fultz wheat you sent me has wintered well and promises to be a valuable acquisition. *Washington:* Wheat has looked badly, owing to dry fall and severe winter, but is improving rapidly now. The Fultz wheat received from the Department last fall, although sown late, looks remarkably well. Considerable has been sown from seed procured in Pennsylvania, and generally looks much better than other varieties. *Harford:* Looks worse than for many years; fly last fall and winter-killed. *Cecil:* Many fields ruined by fly last fall, and very severe winter; little snow. *Carroll:* Very unfavorable. Early-sown grain suffered from Hessian fly, while dry weather and the severe winter have bleached the plant. *Talbot:* Wheat looking badly. Fly in the fall and frost in winter.

VIRGINIA:—*King and Queen:* I never saw wheat or rye in worse condition. These crops, as well as oats, have so diminished in product as to render the return of seed doubtful. There were many instances last year of a product less than the amount of seed sown, and the present crop promises no better. *Highland:* Looks very badly, showing only dead blades above ground. *Henry:* The winter has been unusually severe and there has been more snow in March than ever before known. Wheat-fields look naked, but the roots appear sound and the plants healthy. *Washington:* Wheat worse than for many years. Dry weather all the fall, and from December to March. *Chesterfield:* Backward, but a remarkably good stand. The Fultz wheat received from the Department last fall was seeded with great care and promises well. *Craig:* Freezing has continued to within a few days. *Henrico:* Remarkably fine. Fall late and wet enough to give a good start. *Bath:* Injured by hard freezing and so small an amount of snow in early winter. *Culpeper:* Fields look bare and unpromising from freezing and thawing in March. My Touzelle wheat received from the Agricultural Department three years ago looks about twenty per cent. better than the Fultz, California, or Lancaster, sown at the same time and under equally favorable circumstances. The Scotch rye sent from the Department last fall also looks very well. *Fluvanna:* Looks backward, but is not winter-killed, having been protected by continued snows. *Frederick:* Wheat better than average, scarcely winter-killed at all, but the present cold, dry weather is unfavorable. *Gloucester:* Generally looking badly; that late sown much frozen. *Rockbridge:* Looks better now than in January and February. The snows of March seem to have infused new life into it and a fair crop is promised. *Montgomery:* Wheat below an average in appearance, especially late sown; but it is not winter-killed and may make a good crop. *Rockingham:* Looks well; the dry state of the ground prevented much injury from frost. *Louisa:* No rye raised.

Wheat does not look well; was sown early and had a good start, but the winter has been very severe. *Greenville:* Below average. Severe winter and little snow. *Prince George:* Wheat sown broadcast, especially on clay soil, is much winter-killed, but drilled wheat looks strong and healthy. Little or no rye. *Mecklenburgh:* Far above last year. More snow and ice than almost ever known before, which have protected the wheat. *Campbell:* Looks well, considering the cold and lack of snow early in the winter, but is not as promising now as at first of the year. *Buckingham:* Although there was more snow than for many years past the wheat is looking badly. After it had been covered for several weeks there was a sudden thaw, followed by intense cold, which killed much of it and left the rest exposed. The Fultz wheat received from the Department last fall has proved much more hardy than other varieties, and promises a good yield.

North Carolina.—*Granville:* Much injured by freezing and thawing, with little protection from snow. *Mecklenburgh:* Early-sown looks well; late, poor. *Catawba:* Looks well in spite of severe winter, owing to fine fall growth. *Rockingham:* Looks well; much snow. *Rowan:* Very backward, but a good stand. *Beaufort:* Good; much snow. *Currituck:* Much thrown out. *Wilkes:* Looks dead, but roots seem alive. *Gaston:* Thin stand, from freezing out, but looks well. *Warren:* Unpromising; unfavorable fall. *McDowell:* Owing to late and open fall, it had a good start; looks well. *Orange:* Very bad; much frozen out, especially on red land. *Hertford:* Very unpromising; wet, cold winter. *Stanley:* Winter wheat and rye are in average condition. The stand is good, and if no late disasters cut it off, a fair crop may be looked for. Our early red wheat is, in truth, too far advanced in sunny positions, when late frosts may damage it. The Tappahannock, introduced some years ago by the Department, though not equal to what it was at first, presents a thrifty aspect; its large tussock and broad blades cover the ground all over with a dark, green carpet. Of the Fultz wheat sent last fall it is reported that, so far, "there is nothing remarkable about it, unless it be its slender growth."

Of fifty-five counties reporting wheat, accounts are favorable from thirty, unfavorable from twenty, while twenty-five return "average condition."

South Carolina.—*Anderson:* Wheat late, but healthy; much winter-killed. Eight snows, the last eight inches deep; deepest for many years. *Richland:* Fine; no freezing out, owing to the moist state of the ground during the extremely cold weather. *Union:* Wheat good when sown before November 15; late-sown wheat, small. *Marion:* Early-sown wheat looking well; the Fultz wheat promising. Schonen oats and Scotch rye have not stood the winter well. A large area has been sown in oats and the prospect is good. It is now considered the safest and most economical grain and forage crop that can be raised in the county. *Lexington:* Winter wheat is somewhat backward, and the stand not very good, owing, doubtless, to the late sowing and very cold winter. Wheat sown here on the 1st of October, and moderately fertilized, would almost invariably reward the laborer abundantly; but cotton-seed is generally used for manure, and therefore farmers wait until the last of November, and even later, in order to prevent its sprouting, and thus injuring its fertilizing properties. Besides, the cotton-picking demands the attention of their entire force until about that time, and therefore the wheat crop is generally sown from one to two months too late to produce the best results. The correspondent says: "My own wheat sown in the middle of November, and manured with cotton-seed and Wando

phosphate, looks remarkably well, and bids fair to yield a first-rate crop. This is perhaps partly owing to the seed, it being of the Tappahannock variety, and raised in Missouri, which will be likely to result in its maturing from ten to fourteen days earlier than from seed raised in this locality. The Fultz wheat sent me by the Department is also looking remarkably well, and will apparently sustain the reputation it has acquired in the North. I have some small patches of rye, which look well, though used for pasturage all winter, and will doubtless yield well."

GEORGIA.—*Hall:* Good stand, but very backward. Snow six inches deep March 22. Never known before. *White:* Little wheat sown; much more rye; looks well. *Walker:* Wheat smaller than ever before at same date, but stands good. Rye, average. *Newton:* Backward; winter oats somewhat winter-killed. *Marion:* Wheat not looking well, on account of the extremely cold, wet weather; rye looks well; the Fultz wheat from the Department looks well, but the Scotch rye seems to be a failure. *Gilmer:* Looks well; severe winter, but protected by much snow. *Wilkes:* Wheat in good condition; the Fultz wheat looks best. *Heard:* Wheat backward, but fair. *Cherokee:* Very backward; in some places frozen out until too thin. *Fannin:* Wheat looks 50 per cent. below an average; rye also 20 per cent. below; the Fultz wheat looks better than any other kind; Scotch rye did not germinate. *Dawson:* Generally bad; but where early sown looks well; little rye sown.

In Georgia eight counties report superior condition, twenty-eight a good prospect, two an average, and fifteen an unpromising appearance.

FLORIDA.—*Wakulla:* The correspondent says: "The past winter will be remembered in Florida. I have felt colder weather here, but through January and February it was almost uninterruptedly cold, which is unusual here. The planters commenced planting corn the last of February, but, by reason of the superabundance of wet and cold, the stands are not good and the crops are looking badly.

ALABAMA.—*Lauderdale.* Very promising. Great pains taken in seeding. *Livingston.* Not very promising; much frozen out and sustained only by the fibrous roots still retaining their hold. *Blount.* Much snow, and it looks fine. *Macon.* Large crops of wheat, rye, and oats sown, and look well.

MISSISSIPPI.—*Amite.* Wheat a failure as usual, and red oats a perfect success—entirely rust-proof. *Wayne.* No wheat grown. Rye and oats fine. Attention turned to winter-oats, which do well. Red rust-proof oats a favorite.

Indications of increased attention to cereals appear in Texas, pointing to an enlarged area to be harvested this season. The fields are generally promising. A good account is given of the appearance of the Tappahannock and Fultz varieties. In Cherokee County the condition of the latter, as well as Scotch rye, is 50 per cent. better than other kinds. Abundant rains, causing vigorous growth, are reported from Kendall. Wheat promises to be ripe in Ellis by May 10. A backward condition is reported from Independence, Columbia, and Blanco. Increase of acreage is especially marked in Grayson, Kendall, Lampasas, and Johnson.

The appearance of wheat is generally unpromising in Arkansas. It is not a prominent interest and few counties are reported.

In Tennessee the early-sown wheat is generally in vigorous growth, while much that was sown in October and November was killed or injured by freezing. Careless preparation of the soil is given as another cause for unpromising condition in many places. That which appeared to be frozen out is generally improving rapidly. In Bradley County

the early and the late-sown are looking well, while that seeded in October is winter-killed. In Robertson, Fultz wheat, sown October 27, makes a fine show. The poor appearance of late-sown grains is marked in Meigs, Roane, Lincoln, Madison, and Jefferson.

The accounts from Kentucky are quite various—some promising, others gloomy. A fall drought prevented sufficiently early sowing. In some places where a good stand appears, the severity of the weather has prevented early and rank growth. Several counties compare the prospect favorably with that of last spring, and several present unqualified assertions of fine condition. On the whole, the average appearance is indicative of a fair crop.

Severe freezing and backward condition are reported from West Virginia. There is nothing to indicate an exceptionably poor crop.

A few quite unfavorable reports come from Ohio. Our Franklin correspondent had not seen a green field, and says there has not been rain enough in thirty-six months "to run in a furrow." Alternate freezing and thawing in March, in the flat lands of the northwestern part of the State, have wrought much injury. The appearance of fields is "very poor" in Putnam and Defiance; "much worse than usual" in Medina; "miserable" in Franklin; "worse than for many years" in Lawrence; "much worse than usual" in Medina; and "the poorest ever known" in Jackson. In several counties indications of improvement are reported, and many others make no complaint of injury. With good weather, a fair crop may be expected. Of forty-nine counties reporting wheat, forty-one represent a comparatively unpromising condition.

Nearly all Michigan correspondents report rather an unpromising appearance of winter-grain, or the fact that the ground was frozen and deeply covered with snow. Manistee is the only county claiming an unqualifiedly "good" appearance of all winter cereals.

The condition of winter-grain is included in reports from fifty-six counties in Indiana, of which thirty-nine are below an average. The counties making the most favorable returns are Warrick, Wayne, Floyd, Knox, Clay, Clinton, Carroll, Pike, Scott, Fountain, White, Bartholomew, and Boone. The superior condition of drilled wheat is general. The Decatur correspondent says, but little wheat is discernible except that sown upon clover-sod broken in the summer and rebroken in September. Results of the season remarkably demonstrate the superiority of the drilling.

Returns from fifty-eight counties in Illinois indicate a condition below an average in twenty-six counties; the remainder show either an average or a superior condition. In Fayette the plant is more vigorous than usual; in Morgan it is fine on drilled land; "better than for several years" in Lawrence; "better than ever" in Saint Clair; in Madison, "excellent, never better." In some of the more southern counties the warm weather was having a favorable influence.

Of seventy-six counties reporting in Missouri, forty-nine present comparatively unfavorable returns, four only superior condition, twelve good appearance, while the remainder are equivalent to an average. In De Kalb, "broadcast wheat is mostly winter-killed, while drilled promises well;" in Grundy, where most farmers plow but once and carelessly brush in their seed, wheat is killed; in Marion, drilled wheat is saved from the destruction attending that sown broadcast.

Little winter-wheat is produced in Wisconsin, Minnesota, Iowa, or Nebraska. In Wisconsin but ten counties mention it, of which two return good condition, four average, one poor. Of nine in Minnesota,

three report good or excellent, six unpromising. Houston makes the best return. Of twenty-seven in Iowa, eight make a favorable report, four medium, fifteen unfavorable. The counties making best returns are Benton, Jefferson, Mahaska, and Greene. In Nebraska, four counties report a good appearance, eight lower than average. In Cuming, "wheat is very promising, and it looks well in Burt, Madison, and Hall." In Kansas, twenty-five counties report wheat "badly injured," or "frozen out;" fifteen "poor," or equivalent terms; rye appears better, but is not much grown.

Returns from the Pacific coast are nearly all favorable, both in California and Oregon. In Stanislaus County, California it "never looked better;" "very promising" in Tuolumne; "A No. 1" in Monterey; and elsewhere favorable accounts are given. From Oregon there is not an unfavorable report; the crop is represented to be fine in the counties of Benton, Tillamook, Polk, Clatsop, Yam Hill, Clackamas, Lane, Linn, Curry, Grant, Columbia, Douglass, and Umatilla.

## CONDITION OF FARM ANIMALS.

Horses and mules, the most valuable class of domestic animals, receive more uniformly the requisite care and protection than other stock. If hay is scarce the deficiency is usually made good by extra supplies of grain; and yet the colts and young horses of thinly settled States are often left to the same chances, for pasturage and shelter from the rigors of winter, that are enjoyed by the less valuable stock of the range. With the exception of suffering from the severity of the past winter among this class of unstabled horses, mainly in the milder climates of the country, both horses and mules are reported to be in average condition.

While pecuniary considerations appear to govern the action of farmers in the care of the dumb brutes committed to their protection, it is hoped that no respectable stock-grower will disregard the common dictates of humanity in his treatment of his dependents. A close view of the subject will show that its monetary and humanitarian aspects are usually in harmony; and a man who is a man indeed will be willing to make some pecuniary sacrifice, in emergencies, rather than subject his farm-stock to avoidable suffering. The terrible loss of brute lives by the winter's severity, as recently experienced in Texas, in Kansas and Nebraska, and in Colorado and Wyoming, should be avoided, as far as practicable, by better provision for scarcity of feed, resulting from drought, deep snows, and other causes, and by greater care in providing stock with shelter, either natural or artificial.

### CONDITION OF CATTLE.

The short hay crop of last year, and the severity of the past winter, have taxed the feeding resources of Maine farmers to the utmost. The numbers were reduced as much as possible in the autumn, an unusual quantity of grain has been fed, and yet many have died. The deficient supply has not been made good. In York "a large proportion are in fair condition, but some persons are short of hay, and choose to stint their stock rather than buy;" in Franklin, cattle are in good order,

"more corn having been fed than in ten years;" in Piscataquis they have been kept in condition by feeding grain, with a prospect of feeding more, three feet of snow still covering the ground. In Cumberland, Waldo, Sagadahoc, and Hancock, (where some have actually starved to death,) cattle are in poor flesh.

New Hampshire reports of condition are uniformly favorable, except in Coos, which reports "rather thin, but healthy." In Hillsborough superior condition has resulted from better care and feeding of grain.

Similar accounts are received from Vermont; the least favorable from Addison, Windsor, and Orange. In some sections the low price of beef induced farmers to attempt to keep over too much stock. In Grand Isle and Windham animals are in fine flesh.

Dukes and Norfolk, Massachusetts, are the only counties in that State representing cattle in condition lower than average; Franklin and Hampden, better; the other counties about an average.

"Condition never better," in Bristol, Rhode Island; "poorer than last year by 10 to 30 per cent.," in Washington; "poor, but healthy," in Providence.

Only Middlesex and New London, in Connecticut, report "below an average," from scarcity of hay, which is $40 per ton in the latter. Returns are generally quite favorable.

Reports from thirty-six counties in New York represent condition from "average" to "excellent," (in Niagara,) and "never better," (in Saratoga;) below an average in Otsego, Sullivan, Warren, (hay $20 to $30 per ton,) Ontario, Rensselaer, and Suffolk. In Onondaga there is some complaint of cows not doing well when "coming in." Cattle will have been stabled six months in Genesee by the 10th of May, the assumed time of turning out.

In eighteen counties heard from in New Jersey the condition is generally reported as "good." The correspondent writing from Sussex County states: "The condition of cattle very fair generally. The hay crop being very short, most farmers sowed corn broadcast, which, with straw, will make good the deficiency." In Cumberland, Salem, and Cape May Counties the condition is reported as "poor," owing to scarcity and high price of hay and fodder, and the long and severe winter.

Reports have been received from fifty-five counties in Pennsylvania, the majority of the correspondents speaking of the condition as "fair." The counties reporting "good" are Lancaster, Bradford, Cumberland, Elk, Green, Mifflin, Tioga, Cambria, Huntingdon, Somerset, and Lehigh. The correspondent writing from Sullivan County says: "Improved buildings and accommodations have told favorably upon the condition of cattle, and the fear of insufficiency in the supply of provender prevented the selling off of grain, and induced farmers to take more than usual care of their hay. The result is that cattle look well and will not suffer for provender." In Butler County cattle are said to be just living, owing to long winter and scarcity of food; the remaining counties reporting unfavorably from the same causes are Clearfield, Luzerne, Union, Forest, Adams, Cameron, and McKean.

The reporter for Kent County, Delaware, says the condition is good, in spite of the long, cold winter.

Favorable accounts have been received from the following counties in Maryland: Harford, Cecil, Carroll, Montgomery, Queen Anne, Calvert, and Anne Arundel. The causes assigned for the good condition are the feeding of more grain than usual, and abundance of corn-fodder.

The severity of the winter, and scarcity of hay and coarse provender, are attributed, by the correspondents for the counties of Washington,

Baltimore, and Kent, as the causes of the unfavorable condition of cattle in their respective sections of the State.

The reports from Virginia have been very full and complete; the reporters for sixty-three counties heard from are almost unanimous in speaking of the unfavorable condition of their stock, and all from the same potent causes—"severe winter and insufficient food." The correspondent for Mecklenburgh County says: "The utter failure of the wheat and oat crops compelled the use of straw and corn-fodder for teams, leaving only what could be picked up in the fields, and corn-stubble, for the cattle, and many have starved in consequence." The reporter for Buckingham County says: "Provender is now very scarce, and unless the spring opens very soon many must die of starvation." The only counties giving anything like a favorable report are Amelia, Highland, Henry, Pulaski, Montgomery, Botetourt, and Alexandria.

In more than three-fourths of the counties of North Carolina cattle are represented to be in sorry plight, after passing through an unusually trying ordeal. In fact, the winter was not over on the 1st of April, in some parts of the State, and fears were freely expressed of serious losses from exhaustion of provender before the appearance of spring pasture, such losses actually occurring in many places. Very few county reporters failed to note the severity of the season, the "oldest inhabitant" taxing his memory in vain for a parallel, while the scarcity of food of all kinds seems to have been almost as general, caused in part by the unusual demand upon it, and also by the drought of the preceding summer. In Hertford County the exceedingly bad condition is accounted for by the fact that the young reeds upon which the cattle depend for winter food were killed by the cold.

Greenville and Fairfield Counties alone, in South Carolina, return favorably; scarcity or entire exhaustion of provender being generally complained of, and superlatively bad reports being the rule, based upon the lack of food, and the rigors of an exceptionally cold winter and late spring, which unfavorable conditions were aggravated by a general absence of suitable shelter from the inclemency of the season.

In Georgia the winter was one of great severity, the cold weather and excessive rains telling fearfully upon cattle. Troup County alone, out of sixty-three reporting, returns condition as "excellent," and but nine others report at all favorably; while in the remainder the expressions "deplorable," "worse than for many years," &c., are so frequent as to become almost monotonous. In some parts of the State an unusual amount of snow fell, and from all quarters the scarcity of provender is complained of, resulting in many losses from starvation.

From Florida come the same accounts of the unusual inclemency of the season, with consequent suffering and many losses, although the condition was improving on the 1st of April, and in Levy County the increase of calves was reported at 100 per cent. greater than usual. But two counties heard from (Jefferson and Volusia) make favorable returns.

Lack of food and shelter, together with severity of winter and lateness of spring, are the causes assigned by correspondents in Alabama for the low condition of cattle generally; few counties breaking the uniformity of the report, Lowndes, Lauderdale, and Morgan alone forming prominent exceptions; in the first "better care," and in the last "the dry winter," furnishing explanations of the favorable aspect of affairs.

From Mississippi the returns are hardly more cheering, containing reiterations of the same depressing statements. The season throughout the South has been extremely trying to stock unprovided with shelter,

and depending almost entirely upon the range for subsistence. The reports of heavy losses from actual starvation are frequent, amounting to 50 per cent. of some herds in Newton County. In Wayne, also, many losses are reported, and a rapid deterioration in the ranges has caused a decrease of 80 per cent. in some herds within the past eighteen years.

Several reports from Louisiana are favorable, but the majority represent cattle as suffering from the severity of the winter. The need of care and shelter is repeatedly acknowledged. The La Fourche Reporter says: "Cattle need shelter, as in the North." In some places the losses are heavy, especially on the Attakapas prairies, where one stock-raiser lost four hundred to five hundred out of three thousand, one hundred dying immediately after the snow-storm of March 1. Thousands of cattle are estimated to have perished in Louisiana from exposure.

Three-fifths of the returns from Texas represent condition of cattle below an average. Among the counties in which stock is in "good" or superior condition are Red River, Fort Bend, Ellis, (better than for many years,) Colorado, (better than ever before,) Grayson, Blanco, Austin, Kendall, Williams, Hunt, (better than for two years,) Titus, Collin, Galveston, Harris, (20 per cent. better than last year,) Marion, Bell, and Anderson. The following extracts present a less desirable aspect of the case:

*Medina, Texas.*—Many losses, principally of old cows, from insufficient pasture on the prairies, owing to the dry fall. Improving rapidly now.

*Rusk, Texas.*—Poor; no shelter but the forest, and no food but dry grass and shrubs.

*Nueces, Texas.*—Very poor. Unusually dry for the past year, and water scarce. Cattle died by thousands in the winter, and if we have no rain soon, many cows will be unable to raise their calves.

*Refugio, Texas.*—Wretched, and the loss frightful; the result of the ruinous system of turning the cattle out upon the prairies with no provision for the contingencies of bad weather, &c.

*Bee, Texas.*—Loss, 25 per cent. Not less than fifteen thousand cattle have died of starvation and cold weather; ten thousand hides saved.

While the winter in Arkansas has been unusually severe, the condition of farm animals has been good in a majority of the counties. In Independence County cattle are represented to be in a wretched condition—worse than for fifteen years; and very poor in Montgomery, where there are "no winter-quarters but the woods, and woods-pastures are gradually deteriorating, so that all cattle will soon have to be fed in winter."

A majority of reports from Tennessee are comparatively favorable. The counties making the best returns are Wayne, Johnson, Meigs, Lawrence, Robertson, Rhea, Polk, Coffee, Putnam, Decatur, Blount, Humphreys, and Obion. In Putnam "more attention is given to sheltering." Sevier has had the "severest winter for fifteen years."

The favorable returns from Kentucky greatly outnumber those of poor condition. The winter has been long and severe, and feeding was still continued.

A majority of the reports from the Ohio valley and lake States are decidedly favorable. A few items from correspondence will give an idea of their varied character.

West Virginia.—*Pocahontas:* Fine condition in spite of variable winter. *Greenbriar:* Bad condition and considerable loss. Winter long and cold; feed scarce; some grazers are cutting linn and sugar timber to keep their cattle alive. *Marion:* Cattle look well when well fed. Hay scarce. *Berkeley:* Exceedingly poor and weak; many will probably die. *Clay:* Finer than for years.

Ohio.—*Logan:* Cattle in unusually good heart and condition. Winter pasture has been too much depended upon, though our blue-grass beds, retaining their verdure through summer and winter, have had their influence for good. *Hamilton:* Better than last year; better care taken. *Franklin:* Most excellent; much better care taken.

*Marion:* Very good; feed plenty; weather dry. *Jefferson:* Not so good as last year; winter too long. *Brown:* Moderately good, considering the long winter. *Fayette:* First rate; never better.

MICHIGAN.—*Ottawa:* Long winter and scarcity of feed will cause loss of animals, also of butter and cheese. *Clinton:* Average; unusual amount of straw and grain feeding. *Mecosta:* Thin, but in good heart. *Leelenaw:* Not very good; food scarce through long, hard winter. *Tuscola:* Very good, considering the high price of hay.

INDIANA.—*Hamilton:* Fine; better than common; winter favorable to out-door feeding. *Cass:* Better than for many years; forage well saved; weather favorable. *Clark:* Tolerably good; would have been better but for the burning of prairie-grass last fall. *Decatur:* Good; dry winter; favorable for close feeding. All feed, except corn, scarce. *Crawford:* Poor; feed scarce. Feeding-season commenced six or eight weeks earlier than usual, after many farmers had sold their hay. *Wayne:* Cattle wintered well. No cold rains or sleet. *Parke:* Good so far, but feed becoming scarce. *Union:* Average; scarcity of feed made up by better care.

ILLINOIS.—*Winnebago:* Cattle that have had plenty of water have done well. Supply of water very limited. *Mercer:* Fine; abundant stalk-fodder. *Clinton:* Fine when well cared for. *Edwards:* Good, though feed is scarce; winter dry. *Alexander:* Good, but not equal to last year. *Schuyler:* Remarkably good. *Bureau:* Thin, though food is plenty.

WISCONSIN.—*Fond du Lac:* Thin from long-continued winter—one hundred and thirty-five days of unbroken sleighing. Feed badly dried up before the snow fell. *Ontonagon:* Will be poor before grass comes again. *Juneau:* Good so far, but will be slim by next grass. *Jefferson:* Good, considering the long winter. *Trempealeau:* Extra good.

MINNESOTA.—*Blue Earth:* Excellent. *Meeker:* Generally good, but winter protracted. *Watonwan:* Remarkably good. *Houston:* Excellent generally; feed plenty and cheap. *Winona:* Poorer than usual. *Goodhue:* Very good; winter mild; feed abundant. *Dakota:* Better than last year.

IOWA.—*Plymouth:* Good in spite of the hard winter; hay feeding and shelter extensively provided. Regularity of feeding with a regular salting have been found of great value. *Polk:* Unusually good; corn abundant. *Mahaska:* Better than usual. *Hardin:* First rate; very little feed except what is found in the stalk-fields. *Clayton:* Poorer than for fifteen years. *Lee:* Unusually good; better than last spring. *Jasper:* Better than ever known. *Humboldt:* Excellent. *Grundy:* Poor; county new. Proper care not taken. *Monona:* Fair; some large herds almost fat. Grass will not come before May 10; the average condition will then be depressed.

In Missouri but twelve of seventy-two counties reporting show superior condition:

MISSOURI.—*Cape Girardeau:* Thin, but plenty. *Jasper:* Never better than now; feed plenty and cheap. *Moniteau:* Good, but at heavy expense for feed. *Bates:* Never worse than this spring; winter cold; feed scarce. *Johnson:* Much better than usual. *Howard:* Poor condition; winter extremely cold and blustery. *Franklin:* Poor; winter very severe; hardest frosts ever know in Missouri. *Phelps:* Average, but has required more than usual feed. *De Kalb:* Look hard for want of shelter and feed. *Lawrence:* Twenty-five per cent. better than last spring. *Barton:* Cattle have done unusually well; freer from disease than for many years. The winter has been remarkably favorable, being very dry. *Lewis:* Sheltered cattle have done well.

In Kansas and Nebraska there has been much suffering among the domestic animals, a large proportion of it among the unacclimated Texas cattle, immense numbers of which were kept over by drovers rather than sell at prevailing prices. Native animals are reported in good condition in about half the counties.

KANSAS.—*Osage:* Many cattle very weak, others dying; seem to be starving to death while fed an abundance of prairie-hay which was cut very rank. Only straw and corn-fodder has kept cattle alive. One man lost three hundred and fifty Texans out of six hundred. Many Texas cows do not give milk enough to keep their calves alive. *Marion:* Very poor. Losses through starvation from 20 to 75 per cent.; last fall most of the prairie-grass was burned. Native cattle, average; Texans horribly poor. *Dickinson:* Very poor and weak. Lack of shelter and food. Thousands of Texans have died. *Washington:* Native cattle, fair; Texas and Cherokee very poor; many dying from inanition. *Saline:* Winter harder than ever known. Native cattle have lost lightly; Texans about one-third. *Sumner:* Stock went into winter-quarters poor and are coming out poorer. Cattle kept in the range without feeding have suffered fearfully, some herds losing 75 per cent. and others 50 per cent. Those feeding hay have lost less, from 10 to 25 per cent. A series of cold rains would just now complicate matters seriously. *Labette:* Better than ever before. Feed excellent and abundant. Better shelter afforded. *Bourbon:* Poor, but no worse than usual. No shelter. *Shaw-*

*nce:* Bad condition from want of shelter. *Neosho:* Native cattle good; Texas cattle poor. *Morris:* Texas cattle lost from 35 to 50 per cent. Domestic cattle in good condition. *Ellsworth:* Poorer than ever before known. *Republic:* Below average. Natives in fair condition, but Texans starved out. *Greenwood:* Winter severe on cattle; hay less nutritious than usual; no tame grass sown; wet summer made the prairie-grass rank and poor; very little shelter provided; hence more native cattle have died than usual, and the survivors are quite poor. Texas cattle have suffered still more; losses from 20 to 50 per cent. *Lincoln:* Very poor, generally speaking; cattle have met with heavy losses. Of a herd of 431 Texas and 133 native cattle, one-half of th former and one-fourth of the latter have died. About 8,000 Texas cattle wintered in the county.

NEBRASKA.—*Nemaha:* Condition fair; feed plenty. Texas cattle have suffered from bad weather, and some have died; in *Madison:* Cattle sheltered have done well, but very many have died from lack of shelter. *Merrick:* Very poor; little care taken. *Boone:* Rather thin; many settlers came too late to put up hay. *Webster:* Cattle have suffered severely; large heard of Texas cattle have died, beside many natives.

Cattle have wintered as well in the Rocky Mountains and on the Pacific coast as in Texas, or in the Missouri Valley, from the Mississippi River to Dakota. The grasses, dwarfed and unusually dry in some localities from the droughts of last summer, were more nutritious than those of moister climates. All the reports from Dakota are favorable; some representing stock to be in better order than last spring, "notwithstanding the extreme cold." The stock of the Indian Territory is reported comparatively poor, but generally healthy. Colorado and Wyoming have experienced a very severe winter, "the severest ever known," as some report, with much snow covering the grasses of the plains, and driving herds to the bare-foot hills, often crowding the range and threatening starvation. Yet there are herds in these Territories that are in good condition, having suffered little loss. From El Paso County, Colorado, which has a very high elevation, the report is "fine condition, better than last year." The winter has tested the reliability of this region for winter stock-feeding, and proves that a limited number, with proper attention suitable natural or artificial protection, and feeding in storms or heavy snows, can be cheaply kept, with as good a prospect of immunity from suffering or loss as in almost any other section of the country. In New Mexico the winter has been exceptionally favorable for stock-raisers, and almost equally advantageous in Utah; only in Summit County are cattle "generally poor, the winter being unusually wet and stormy." The severe droughts in Arizona, for two or three seasons past, have interfered sadly with the condition of stock in that Territory. In Montana, cattle are thin, but healthy, and in Washington they are generally in fine order, as also in Nevada, and in Oregon, except where entirely neglected. In South California the drought of last season left little feed for winter, and cattle suffered much in the early part of the season. Favorable returns come from Plumas, Santa Clara, Del Norte, Lake, Mendocino, Tuolomne, and most of the northern counties.

## CONDITION OF SHEEP.

In a majority of the counties in New England, sheep are reported in good or average condition, although the winter has been long and the latter part unusually severe, occasioning in many places considerable loss of lambs.

Scarcity and high price of hay are complained of in several counties, but, where the deficiency was supplied by an increase of grain feed, the result was rather favorable than otherwise. The advance in the price of wool has also acted as an incentive to increased attention to the comfort of flocks.

Our correspondent in Piscataquis County, Maine, writes as follows:

Sheep are not yet out of winter quarters, but look better than usual, owing to freer use of grain to make up the deficiency in hay. There has been a marked improvement in the condition of flocks within a few years. We have become convinced that, the better the breed and the more the care bestowed, the greater will be the profit.

The most unfavorable reports are from Oxford and Hancock Counties, Maine: In the former the loss of lambs dropped, up to April 1, was placed at 15 per cent., while in Hancock many sheep have died from scarcity of hay. But two other counties in the State (Cumberland and York) show less than an average condition. From Kent County, Rhode Island, we have the annexed statement:

Sheep were in rather better than average condition a month ago, but March has been almost unprecedentedly severe, and, as it is usually the lambing month in this county, there has been more than the average percentage of loss, both of sheep and lambs.

But three other reports of similar tenor were received from New England, while the expression "very fine," "first rate," &c., are frequently used.

From New York the reports are favorable, with a single exception, *i. e.*, Warren County, where they are "poor from the long, cold winter and scarcity of provender." Twenty-one counties return fair average condition; other reports vary from "better than usual" to "first rate." The season, although cold, was generally dry; "not a single rainstorm" in Livingston County, and in Sullivan "the ground bare most of the winter," &c.

In New Jersey, Pennsylvania, and Delaware there has been very little complaint of unfavorable effects from the unusually cold winter, Cape May County alone, in New Jersey, reporting "very poor," the others ranging from fair to very good, while out of forty-four counties in Pennsylvania, but five make unfavorable returns, the causes assigned in these cases being severe weather and scarcity of provender.

The beneficial influence of the advance in price of wool is frequently cited in the Middle States, as well as New England.

The reports from Maryland are not so uniformly good, especially from the Eastern Shore; the cause assigned is the severe winter and, in several instances, scarcity of provender. There is much disparity in the climatic conditions of different sections: In Washington County the condition of the sheep is not so good as last year, but the loss of lambs less, from the dry weather, while much snow and great loss of lambs are reported from Calvert.

The following is an extract from the return from Queen Anne County:

Sheep are looking well. The great advance in the price of wool has made farmers more than usually careful of their small flocks, all being now desirous of increasing their numbers—so much so, indeed, that I fear many will finally run into the other extreme.

In Virginia the showing is still more unfavorable; a small majority of the sixty-one counties reporting place the condition below an average, the general complaints being scarcity of provender and the severity of the winter-snows. Losses of lambs from these causes are reported in the counties of Bath, Campbell, Fluvanna, Prince William, and Chesterfield; in the last-named county, in some good flocks, which were not properly sheltered, almost every lamb perished.

The following is from Buchanan County:

Sheep are in usual condition. They are rarely ever fed, but run in the mountain ranges all the year round, as the deepest snows generally thaw in two or three days on the south sides of the mountain and winter fern is abundant.

The general tenor of reports from the Carolinas and Georgia is not favorable, the winter having been severe, and in many places food scarce from the drought of the preceding summer or the unusual lateness of spring pasture. In the counties of Harnett, Rockingham, Franklin, Alexandria, and Transylvania, North Carolina; Lexington and Kershaw, South Carolina; and Cobb, Heard, Clayton, and Pickens, Georgia, insufficiency of forage is especially noted, while in Madison, North Carolina, the bad condition is supposed by some farmers to be the result of too free diet of acorns in the fall and early winter. Stokes County, in the same State, also reports an abundant mast, but no ill effects from it. The severity of the winter has told against the young lambs in some localities, a loss of more than 50 per cent. being reported in Davie County, North Carolina, and "lambs dying fast" in Fannin, Georgia; and in McDuffee County, same State, the loss of old sheep is estimated at 20 per cent.

Although these unfavorable reports cover a majority of the counties in each of the three last-named States, a large minory of the returns indicate an "average" condition, and from that up to "very fine" in Forsyth, North Carolina. About the same condition obtains in Florida, but in the other Gulf States, Arkansas, and Tennessee, more than two-thirds of the counties reporting range from "average" to "better than for ten years," in Hunt and Williamson, Texas. Where the returns are unfavorable, it is generally attributed to the severity of the winter and lateness of spring. The most prominent statements of this character are from Hillsborough, Florida; Livingston, Choctaw, and Bibb, Alabama; Yalabusha, Jasper, Grenada, and Yazoo, Mississippi; Washington, Louisiana; Fayette, Nueces, and Cherokee, Texas, (the only unfavorable reports from that State;) Columbia and Independence, Arkansas; and Sevier, London, Giles, and Johnson, Tennessee. In Conecuh, Alabama, two-thirds of the lambs were lost from late cold weather and rains, although the adult sheep were looking well. Fentress, Tennessee, also reports considerable mortality among lambs.

Correspondents in nine counties of West Virginia report less than an average condition; of these, Tucker and Randolph return "very poor," Berkeley "poor and feeble," the rest using adjectives of lesser import. In Upshur County "sheep have done remarkably well, considering they have been without shelter or grain-feed," and in Mercer they have wintered better than cattle, one flock of four hundred head having subsisted upon short grass and the roots of blue grass, with less than one ton of hay. Other returns vary from "good" to "excellent."

From the western States, (California excepted,) and also from the Territories, come very generally cheering reports, not one of contrary tenor from Ohio; and only the counties of Macomb and Mecosta, Michigan; Crawford, Perry, and Switzerland, Indiana; Jersey, Illinois; Iowa, Wisconsin; Nicollet and Winona, Minnesota; Grundy, Iowa; and a very small proportion of those in the other States marring the favorable showing.

In a few localities complaint is made of the shedding of wool from the effects of the severe winter or scab, the most marked instance being in De Kalb County, Missouri, where many are reported "naked from scab, and dying from poor keeping." In Ottawa, Michigan, they "suffered considerably with ticks, from close confinement, and most of the lambs perished." Loss of winter lambs is also reported in Fayette, Ohio, although the dams were in good condition. Few complaints have been made of scarcity of provender, and a general inclination to give more attention to this class of stock is evinced.

From California the statements are very conflicting, but their general tenor is much less favorable than from other parts of the West, as is indicated by the following extracts from county reports: San Diego, "Wintered badly; very poor in January; Stanislaus, "Poorer than ever before; loss by starvation 5 per cent.;" Del Norte, "Splendid;" Sonoma, "Very poor; winter severe;" Toulumne, "Above average; mild winter;" San Bernardino, "Poor; food cut short by drought," &c.

## DISEASES OF FARM ANIMALS

Disease has not cut off an unusual number of farm animals during the past year. Where cattle are most valuable, whatever the rigors of the climate or local scarcity of feed, the loss by disease is comparatively small, by reason of the care which is found by long and bitter experience to be profitable. A large proportion of the losses reported is the result of neglect, exposure, and insufficient or innutritious pasturage or other feed. Some mortality and much reduction of flesh result from the inhumane practices of drovers, with the aid or abetting of transportation companies. Several deaths are reported at Alleghany City, resulting from the barbarous practice of stuffing animals with salted feed to induce them to drink largely, for the purpose of making good upon the scales the depreciation in weight occasioned by the deprivation and suffering of the passage by rail. The occurrence of "murrain," "hollow horn," and diseases reported by various meaningless names so common in the Southern States, where cattle are left to the tender mercies of a rigorous winter and dead woody stalks of coarse grasses, might be avoided in a large measure by adequate attention to necessary supplies and protection.

The rigors of the past winter have proved conclusively the necessity of protection, not only in the more northern of the Southern States, but in Texas, where large numbers of cattle, estimated variously at 100,000 to 200,000 head, have succumbed to the combined agencies of cold and starvation. The pretense that shelter is unnecessary on the elevated plains of Colorado and Wyoming is also exploded, large losses, especially of Texas cattle, having occurred during the past winter. It is true that small herds, and in some cases large ones, have been sheltered in the cañons and in the lee of banks of streams, and wintered with little loss; but it is unmerciful and untrue to assert that no provision for shelter is or will be necessary in those elevated pasture-grounds of the plains and Rocky Mountains.

Horses have suffered less than in some previous years. Cases of the various forms of disease reported have generally been isolated.

The details concerning diseases of the several species of domestic animals will be given under separate heads, and will convey an idea of the comparative prevalence of each form of disease.

### DISEASES OF HORSES.

LUNG FEVER.—Horses have been comparatively free from this disease throughout the country. Several fatal cases are reported from Aroostook County, Maine. The animals were at first affected with what appeared to be a violent cold, soon followed by prostration and death. Franklin County, Vermont, reports two deaths from this cause. A few fatal cases are also reported from Chester County, Pennsylvania, and

Upshur County, West Virginia. The correspondent for Queen Anne County, Maryland, in writing of this disease, says: "Many horses die shortly after the attack, from want of timely and proper attention; but when taken in time the disease will almost universally yield to proper treatment and careful diet."

PNEUMONIA.—But few cases are reported. It was, however, the prevailing disease reported by the correspondent for Providence County, Rhode Island; and a few cases are heard from in Queens County, New York.

STAGGERS is reported by the correspondent for Moore County, North Carolina, as existing to a considerable extent. Cases also occurred in Bladen and Craven Counties. In the latter county it attacked young animals chiefly, destroying at least 50 per cent. of those attacked. The correspondent suggests the following treatment: "Bleed freely from the neck, followed by a good drench of salts; elevate the head, forcibly inject two ounces tincture cantharides up each nostril, to blister mucous membrane, and act as a derivative; feed with a mash of wheat-bran, occasionally oats, each scalded thoroughly, plenty of cool water, and moderate quantities of green fodder if attainable." Losses are also reported from Fairfield County, South Carolina, supposed to have been caused by eating unsound corn, or that which had been overflowed in meadows. Wilkinson County, Georgia, reports cases; also Tuscaloosa County, Alabama; Lee County, Mississippi; Cherokee County, Texas; Jackson County, Arkansas; Coffee and Lauderdale Counties, Tennessee.

GLANDERS.—But few cases are reported. Several died in Litchfield County, Connecticut; a few cases existed in Surry County, Virginia; Hillsborough County, Florida. It has prevailed on one farm in Winston County, Mississippi; a few cases in Mercer County, West Virginia; and Trimble County, Kentucky, reports fifteen or twenty cases.

DISTEMPER, spoken of by many reporters as diphtheria, has existed, but doubtless the majority of the cases so described were nothing more than those of ordinary distemper. The correspondent for Niagara County, New York says the disease proved fatal at first, but after a little experience was treated successfully. Cases are also reported from Luzerne County, Pennsylvania, where it is termed a "malignant distemper;" Buncombe County, North Carolina; Chesterfield County, South Carolina; Orange, Hillsborough, Manatee, and Santa Rosa Counties, Florida, and Choctaw County, Alabama. In Victoria, Austin, and Nueces Counties, Texas, many colts, and in some cases grown animals, have died. The disease has also existed in Izard County, Arkansas; Upshur County, West Virginia; Lewis County, Kentucky; Madison County, Indiana, and in Boone County, Illinois. Sonoma County, California, an "epizootic distemper" is spoken of; the cases yield readily to treatment.

FARCY.—A few cases have occurred within a short time in Buckingham County, Virginia. The disease was originally introduced by the Army horses, in 1865. Every case heard from in this county proved fatal, obstinately resisting all remedies, and serious apprehensions are entertained that the much dreaded malady will spread as the spring opens. Choctaw County, Alabama, reports a few cases.

CHARBON is reported only from Phillips County, Arkansas. The treatment adopted was to sear the affected part with a hot iron and scarify the wound a few days afterward.

QUINSY prevailed only in Baltimore County, Maryland, and, though not often fatal, interfered very much with farm work last spring.

BOTS.—A few animals were attacked in Winston County, Mississippi,

and Obion County, Tennessee. The correspondent for the latter county says: "The remedy is to give sage tea, sweet milk, and molasses, which causes the worms to let go their hold, and then an active purgative to carry them off."

Cases of "new" or "unknown" diseases are reported by correspondents which it is impossible, from the descriptions given, to place under classified heads, the general symptoms in many cases only being given or a statement to the effect that they resemble diseases of a particular type.

The following account is from Norfolk County, Massachusetts: "Within a few days a large number of horses belonging to the street railroad companies have been affected with a new disease; it has proved fatal in several cases, and as yet no positive remedy has been discovered."

In Litchfield County, Connecticut, deaths resulted from a disease resembling farcy or glanders.

In Washington County, Pennsylvania, seven died of an affection resembling inflammation of the intestines.

The reporter for York County, Virginia, says: "Nearly all the horses died on one farm from some unknown cause."

In Wakulla County, Florida, many losses occurred, especially among mules: "On examination the intestines were found to be filled with sand."

In Crittenden County, Arkansas, buffalo gnats kill more than all the diseases.

Huntington County, Indiana, reports numerous deaths from diseased lungs, throat, and head.

The correspondent for Peoria County, Illinois, says: "A neighbor of mine raised Hungarian grass last year for hay; fed it to his horses during winter; one horse became entirely disabled, 'stiff;' the animal finally recovered."

In Clackamas County, Oregon, the "stiffs" is considered incurable, and is supposed to be caused by a dry fern mingling with the hay.

Several horses died of a new disease in Dickinson County, Kansas, the symptoms of which are as follows: "Cough, yellow matter running from the nose, swelling of the throat, increasing weakness, and death. It is not distemper or glanders; veterinary surgeons do not know what to do with it nor what it is."

During May and June, 1871, a fatal malady was developed among the horses used by the different street railroad companies of New York, and extended its ravages also to the horses owned by hackmen and truckmen. Horses used to work, but kept on highly nutritious food, and suddenly put to hard work after a period of repose, were especially liable to the disease. At first the animal stumbled with his hind legs, which became shaky and difficult of movement. The hind pasterns became infirm: the joints between the upper pasterns and the shanks bent forward, in some cases breaking down, the animal finally becoming unable to stand and remaining in a lying posture. All the muscular movements dependent upon nerves radiating from the spinal colum, behind the dorsal vertebræ, were gradually paralyzed. When the horse lost power to move his tail or to retain his evacuations the case was considered hopeless. Prior to that point a cure was not impossible. Removal to comfortable quarters, placing the food within easy reach, and perfect quiet were found generally effective. Where fever was low it was not judged necessary to use drastic medicines. Fever was removed by counter-irritants, especially strong fly-blisters. The disease seriously affected the efficiency of the railway companies for several weeks.

## DISEASES OF CATTLE.

SPLENIC (TEXAS) FEVER.—A few cases of this noteworthy climatic disease are reported. The same distinctive features mark every outbreak. New evidences that its germ originates in the miasmatic or tide-water region, not only in Texas, but in all the coast lands from Texas to Virginia, accumulate yearly. Our correspondent in Fluvanna County, Virginia, (north of the James River, between Richmond and Lynchburgh,) thus writes:

> There are some strange facts connected with the cattle disease common to the lower tide-water counties of Virginia, known commonly as murrain, bloody urine, or distemper, which may throw some light upon the Spanish fever following in the track of Texan cattle. In certain districts of this State murrain has always prevailed in certain seasons, attacking most frequently young and fat cattle of both sexes. It is well understood that if cows are removed from Upper Virginia to Richmond, or the lower counties, they are very apt to die the first year, whereas cattle brought from the lower counties up to Richmond escape. For this reason milch cows brought from Gloucester and other lower counties are much preferred by Richmond buyers; yet, in Gloucester, I have known seven cows out of ten to die of murrain in one fall. Again, throughout certain counties on the south side of the James River, extending to the North Carolina line, cattle are subject to murrain, while in other counties directly abreast of them, on the north side of the river, the disease is unknown, unless communicated by cattle brought from the south side, that in some way infect them, while those from the south side keep well. There seems, then, to be some inherent taint in the constitution of cattle living in certain regions, which may be communicated by contact, and this, while in some cases traceable to climate, in others exists when we can discover no difference in climate. A long acquaintance with Texan cattle introduced into Louisiana warrants the opinion that they neither die themselves of this disease nor communicate it to the native herds in Louisiana.

The fact that Texas cattle do not communicate the disease to Louisiana stock is well known, and the reason is obvious, viz, both sections are miasmatic. The coast cattle do not communicate splenic fever to other coast cattle, but to herds above tide-water. The fact is indisputable that cattle of the tide-water counties of Virginia, the Carolinas, Georgia, Florida, and other States on the Gulf coast, do communicate a fatal disease to stock of higher elevations and more salubrious climate, and that this disease has very marked and distinguishing symptoms and peculiarities which are almost invariable.

A correspondent in Murray County, Georgia, writes of a disease which he thinks, from *post mortem* examination, presented "well-marked and clearly defined cases of splenic fever." He says it has broken out each summer since 1865, and continues till frost. He does not describe its attendant circumstances and symptoms, or say whether its advent was heralded by the coming of coast cattle. It may, therefore, or may not, be the veritable splenic fever. Murray County lies in the northwest corner of the State, toward Chattanooga, and appears to have a climate in which the splenic contagion might take. In Gilmer, an adjoining county, are reported "a few cases of Spanish (splenic) fever among cattle brought from more southern latitudes." If the true splenic fever, this must be misreported, and must refer to native cattle "among cattle brought from more southern latitudes."

In Knox County, Tennessee, this disease prevailed last summer mainly among milch cows exposed to contact with Texas cattle at a point where they were fed, in their passage to Virginia.

In Lincoln County, Kentucky, in February, 1871, thirty-five Texas cattle were pastured with native stock. In July, the latter began to sicken of Texas fever, and about twenty died. The Texans fattened and did well.

In Logan County, Illinois, seventy-five Texas cattle were placed in

pasture with two hundred natives, mostly three-year-old steers; thirty-four head of the latter died of the fever. A drove in Cass County lost seven that had contracted the disease by being shipped from Kansas in cars in which Texas cattle had been carried. In Scott County several deaths from Spanish fever are reported.

In Taney County, Missouri, twelve animals were attacked with splenic fever; only one recovered.

The disease has existed in Kansas more than elsewhere, on account of exposure to cattle from Texas. In the northeastern part of Sedgwick County, where Texas cattle were pastured to the utmost capacity of the "range," many of the native cattle died. In other portions of the county, in which Texas cattle also ranged, the loss was small. Only native cattle were attacked, the improved breeds suffering most, and the scrubs least. In the southern part of Neosho, where Texas cattle were pastured, native cattle took the disease merely by crossing the track of the Texas. In Morris, the loss by splenic fever was 25 per cent.; some farmers lost all their native stock. The loss in Marion is estimated at 100 per cent. The loss in Lyons is placed at 5 per cent.; in Montgomery, 10 per cent., but no case occurred among cattle in inclosures; in Allen, one hundred head; in Labette, where the stringent law against the movement of Texas cattle was evaded by driving across the border at night, many cattle in the vicinity of their trail were attacked, and three-fourths of the number died. In Dickenson and Washington several cases occurred. A drove of Texans passed through the southeastern part of Woodson in August, and in about two weeks the disease broke out among the native cattle, with fatal effect.

The following is an account of the breaking out of this disease in a high latitude:

*Fort Randall, Todd County, Dakota.*—An outbreak of "splenic or periodic fever" among beef-cattle, (about two hundred head,) at this post, commenced in May, 1871, when ten deaths occurred; in June, six; in July, ten; in August, twenty-two; and in September, three. The epidemic reached its acme about the middle of July. The total number of deaths, in two hundred head of cattle, was fifty-one. Mode of invasion, rapidity of course of disease, and death occurring at an early period, together with *post mortem* appearances, prove conclusively that it was "splenic fever," the affection described by Professor John Gamgee, in report of the Agricultural Department. It is highly probable that the cattle arriving here in two different lots have had the disease communicated to them by passing over, or having been herded in, sections of country previously traveled over by droves of Texas cattle *en route* to supply the various Indian agencies along the Missouri River.

The disease is reported by correspondents in Benton, Prairie, and Independence Counties, Arkansas.

*Independence County, Arkansas.*—Spanish fever has not been seen for three years past—that is, since the law was passed prohibiting the passage of Texas cattle through the State—until last June, when five wagons from Texas, drawn by twenty yoke of oxen, passed northward on one of our principal roads, camping a day or two in a place, and their cattle allowed to graze near the road; and, strange as it may seem, fever attacked our own cattle at each of these camping places within this county, and probably one hundred of these cases proved fatal. Those in pastures, having no access to these places, were not attacked. The infection seemed to lose its influence in about thirty days after the passage of the Texas oxen. I am not able to give the actual loss in this county at that time. It was probably between one hundred and one hundred and fifty head.

Several cases are reported in Nemaha, Nebraska; and heavy losses in Santa Clara, California, are imputed to splenic fever, but the facts are not sufficient to identify the disease as splenic fever.

PLEURO-PNEUMONIA.—A dozen cases of this disease have occurred in Ocean County, New Jersey. It was treated by bleeding, blistering, the use of carbolic acid about the stalls, of aperients and diaphoretics. In Burlington County the county agricultural society, at its annual

meeting, appointed a committee to urge the State legislature to devise measures for the extermination of the disease, which had a foot-hold in that vicinity. In the northern part of the county three cows and a bull in a herd of twelve were attacked in September, and died. No cattle had been introduced into the herd for a year previous. Two other herds in the same locality were attacked in December and suffered till March, with a loss of eight head. One calf died at six weeks old, although the mother showed no signs of the disease. Not a single animal recovered which showed positive symptoms of the disease. On fifteen farms in Camden the aggregate loss from this disease is placed at one hundred and twenty head.

Pleuro-pneumonia has prevailed to considerable extent in Baltimore County, Maryland, principally in the vicinity of Baltimore City, the heaviest losses generally occurring where the cows were kept in close, filthy stables. Experience has shown that cleanliness and thorough ventilation have great effect in checking the disease. There are still some cases, and it is proposed, if it does not soon abate, to try inoculation, which is claimed to be safe and reliable.

Pleuro-pneumonia has also prevailed to some extent on several farms near Chadd's Ford, Pennsylvania, with a few isolated cases in other parts of the county.

EPIZOOTIC APTHÆ.—"The foot and mouth disease," recently introduced from Europe, is not reported as prevailing at any point at the present time. In the early part of 1871 it still lingered at several points in New England, as in the vicinity of Providence, Rhode Island, and in Litchfield, Connecticut. The infection came to the latter point from Albany, but animals infected were kept isolated and the disease spread very little.

ABORTION has not been so prevalent as to be especially referred to, except in Oneida County, New York, where 5 per cent. of the calves were lost, occurring mostly where the cows were weakened by being milked late in the winter; in Otsego, where a few cases occurred; in Chenango, many cases, the loss to the farmer in each being from $15 to $25; in Litchfield, Connecticut; in Essex and Sussex, New Jersey.

In Mercer, Pennsylvania, a fever and inflammation of the womb has prevailed among cows soon after calving, which has generally proved fatal unless prompt attention is given.

"BLACK LEG" is reported in many places in different sections of the country. No remedy is reported as efficient.

In Coryell, Texas, many deaths of cattle were caused by the "heel-fly," which resembles the bot-fly, and is a great annoyance, driving the cattle into the water and into thickets where they cannot graze. It appeared about January 1.

VARIOUS DISEASES.—Our correspondent in Kent, Michigan, thus describes a prevalent disease:

A cattle disease commenced last fall east of Ionia, extending on the north of Grand River, westward to Plainfield, and thence south over a belt of country. It attacked cattle of all ages and conditions, but especially young cows. It affected the fourth stomach, duodenum, liver, gall, bladder, and circulating system. The pathology of the disease showed, upon dissection, a putrediuous formation, and a discharge of bile into the duodenum from the pale ash-colored, macerated liver. The predisposing causes of the disease are various. The diseased bile from the liver is evidently the reason of the putrid contents of the duodenum, but whether this springs from smut in corn is another question. A cow which sickened and died within an hour had been fed daily for two years with a pailful of kitchen swill and two pailfuls of bran, with such coarse food as she could pick up from various dung-hills. The course of the disease is rapid, generally from half an hour to two hours. The animals are uneasy, stepping about, striking their hind legs against the abdomen, lying uneasily upon the

ground, groaning, feeble pulsation of arteries, heart-action reduced, breathing somewhat quickened, the mucus coat of the mouth and eyes looks pale and bluish, paunch mostly full of food, but not distended with gas, nose and extremities cold. A *post-mortem* examination shows that muscular and nervous systems are in a normal condition, and that all the organs within the thoracic and abdominal cavities are healthy, except the liver, the gall-bladder, the duodenum, and the pyloric portion of the abdomasum, which shows no signs of congestion or inflammation, but are bloodless and colorless. The serous coating is of a pale-bluish hue; the muscular coat of the duodenum a darker hue; the softened mucus coat of a darker violet. The gruel-like contents of the duodenum, from the point where the biliary and pancreatic ducts discharge their fluids into it, are of a pale or greenish-black color, diffusing an intensely penetrating foul smell. The coating of the liver is of a pale-tan color, and its substance soft. The gall-bladder is of a dark-pale green. The mesentery, stomachs, and digestive canal on either side, from the pyloric portion of the abdomasum and duodenum, are bloodless and pale. The blood is black, insufficient in fibrine. These facts all indicate that the disease consists of a peculiar disorder of the liver, caused by a diseased state of the blood; the bile secreted from the same in turn disorders the digestive function and produces an unhealthy gastric juice. No treatment has been found effective. To a certain degree the disease may be prevented by avoiding all smutty, rusty, musty, or overripened corn, and by feeding roots always seasoned with a little salt, with an abundance but not an overplus of pure, clear water.

In Bedford, Tennessee, several deaths are attributed to the same cause.

In Washington, Kansas, disease, attributed to eating smutty stalks, has been fatal in few cases.

Our correspondent in Orange County, Florida, refers to the prevalence of salt-sick, attributing it to the deficiency of phosphates in the grass. A similar report comes from Levy County, Florida. Cattle began to look badly in September, after the wet season and high water of August, and nearly one-third have since died.

"BLACK-TONGUE" has been very fatal in Suwanee, Florida, destroying from one-tenth to one-half of several herds, while others were entirely exempt. "The throat swells at the root of the tongue, as in horse distemper, and prevents the animal from eating." The same disease has prevailed in Worth County, Georgia, where the loss has been greater than the natural increase. "The symptoms are stiffness in the legs, turning around and staggering, slavering, tongue black and coated, unable to eat."

"HOOF-AIL" has been common in Essex, New Jersey, and several cases are reported in Hunterdon, supposed to have been brought by drove-cattle from Western New York and Pennsylvania. Blue vitriol, tar, and lard, and sometimes salt and water or fish-brine, were applied as remedies.

The following extracts from correspondence give accounts of several nameless, misnamed, or unknown diseases:

*Aroostook, Maine.*—No fatal disease, but all of my horned-cattle suffered, about the 1st of March, from a sudden attack of scours, without any apparent cause, and there have been quite a number of similar cases while the animals were being fed on dry hay.

*Patrick, Virginia.*—A disease is now prevailing here called "bloody murrain," "dry murrain," or "lung disease." Cattle are often affected some time before the discovery is made. The symptoms are sluggishness and emaciation, although the appetite is good, accompanied by a flow of blood from the bowels when a purgative can be made to take effect. A *post-mortem* examination shows that the food has become hard and dry in the stomach, and the lungs congested. No specific is known, though a drench sometimes gives relief. The disease seems to abate in very cold weather.

*James City, Virginia.*—Several cows have been singularly affected this winter. Two milch cows with weakness of loins and partial loss of use of hind legs, and one with inflammation of eyes, bordering on blindness. These animals appeared well in other respects, and had good appetites. They improved on a change of food from corn to rutabagas.

*Lunenburgh, Virginia.*—A *post-mortem* examination was made upon some cattle lost last summer from a disease called "distemper." It was found that the first stomach was

highly inflamed, and contained considerable quantities of old-field grass, called "broom," (embracing three distinct species of *andropogon*,) in an undigested state and compacted into hard wads. If these cases were really distemper, the examination showed the immediate cause of death, but did not make it clear whether the digestive organs were deranged, or the substance entirely indigestible.

*Gloucester, Virginia.*—The disease known as "murrain" has prevailed to an alarming extent. On one farm twenty-one out of thirty cattle died, and on a place adjoining the loss was two out of twenty-two. Each of these herds was penned at night, but they ranged within the same inclosure during the day.

*Henry, Virginia.*—A disease called "Carolina distemper" prevailed in the southwestern part of the county last August and September, carrying off more than fifty head. It was fatal to 75 per cent. of the cattle attacked.

*Chesterfield, Virginia.*—A very fatal disease prevailed in the autumn, which resembled murrain, but was not certainly named. Loss, at least 10 per cent. of the cattle in the county.

*Harnett, N. C.*—Considerable mortality from a disease called, by some, murrain or yellow murrain, for which no remedy has been found. Symptoms, loss of use of limbs, soon followed by death.

*Stokes, N. C.*—A fever called distemper or murrain has carried off many cattle—two-thirds of all attacked—although many farmers profess to be able to cure it. Costiveness and discharge of bloody water usually are symptoms. I have used with success, for many years, as a preventive, a mixture of equal parts lime and salt placed where the animals had free access to it.

*Kendall, Tex.*—During last December twenty-six head of cattle died upon three farms from a disease supposed at the time to be hydrophobia. The symptoms were distended nostrils, wild and glassy appearance in the eye, and frothing at the mouth.

*Fayette, Tenn.*—Considerable loss from what was called murrain. It commenced during the drought of last fall, and is believed to have been caused by the grass becoming too dry to digest properly, and a plentiful supply of water not accessible. The consequence, obstruction, followed by death. There have been no cases where farmers have been careful to keep their cattle loose in the bowels; no remedy where the disease once got a firm hold.

*Renville, Minn.*—Considerable mortality from drinking bad, stagnant water. A mixture of six parts salt, two parts sulphur, and one of saltpeter, has been found valuable

*Meeker, Minn.*—During some seasons past considerable numbers of cattle have had swellings on the lower jaw, breaking out into thick ropy discharges for several months. Several deaths have occurred. No name nor cure for this disease has been found.

*Hardin, Iowa.*—Numerous deaths from "bloody murrain" or "quarter kill." It commenced in the fall of 1871, and was found almost invariably among the yearlings and calves of the previous spring that had become fat on the prairie range. Our correspondent has allowed his cattle the prairie range with his neighbors, and has never lost a single animal by the disease, while every one of his neighbors, *without exception*, has lost a greater or less number. He yards his animals every night, and gives them as much salt as they will consume. This is the only difference in his treatment from that of his neighbors.

*Pawnee, Nebr.*—A few deaths of animals from roaming in the stalk-fields. Symptoms, the animal refuses to eat; stands from half an hour to two hours; becomes blind; staggers and falls; death within two hours. The *debris* in the manifold or first stomach become nearly dry enough to burn.

*Santa Clara, Cal.*—Heavy loss from a new disease, the post-mortem phenomena of which are identical with those given in Gamgee's report. At least one-fourth of the farmers have lost more or less. One lost all his cattle and horses. Frequently animals fall dead while eating or drinking, showing no special symptoms.

From Mr. Roger Conant we have the printed report of a committee appointed to investigate the causes of a new disease which has been prevailing to a considerable extent among the cattle in the vicinity of Santa Cruz, Santa Cruz County, California. From this report we learn that the first symptoms of the disease is a desire to rub some part of the body, usually the nose, ear, jaw, leg, or side. The animal uses its feet, or any convenient object, such as a tree, fence, or post, to rub against. The itching seems allayed somewhat by the friction, but soon returns with increased violence, until the hair and skin are quite rubbed and torn off. The parts swell and fill with a serous fluid, as the disease advances. The animal becomes frantic, and dies from eight to twenty-four hours after the first symptoms have shown themselves, apparently from exhaustion. Sometimes they bloat before death. But little de-

rangement of the secretions is noticeable. There is no fever, and the circulation at first is normal, becoming weaker and more rapid toward the last. Several *post-mortem* examinations of cattle dying of this disease were made, but without satisfactory results, as each case seemed to present different features.

The report of this committee was submitted to R. McClure, veterinary surgeon of Philadelphia, who replies that the disease as described is clearly parasitic *(entozoa)* in its character, and is due to picking up from the pasture the tiny *ova* of one or other of the many parasites inhabiting the "unclean hog," as the *cysticercus fæmia solium* and *serratum*, the *trichina spiralis*, &c. When the *ova* of the *cysticercus* of the hog is swallowed by young persons and young animals measles *(rubeola)* is the result in one, and a disease of the brain in sheep and cattle in the other. The disease, then, is the result of swallowing the *ova*, or eggs, of parasites ejected from the hog, giving rise to constitutional irritation, followed by effusions of lymph fluid, or serum into the subcutaneous tissue, and hence the extreme itching, in these cases exhibiting effusion (water) on the brain or at the base of the horn, is merely the partial development of *hydatids hydrocephalus*, sturdy, &c.

## DISEASES OF SHEEP.

Foot-rot.—In Orange County, Vermont, foot-rot has prevailed to a slight extent, but increased care and cleanliness have greatly limited its range. In Berkshire County, Massachusetts, two years ago, it infected nearly every flock, but, by culling out diseased animals and by increased care, foot-rot is seldom heard of. In New York it is reported to a slight extent, in Oneida and Onondaga Counties, and in a mild form in Ontario. In Columbia its virulence is declining, and it generally yields to an application of white vitriol. In Yates County, however, it was very destructive, affecting 75 per cent. of the flocks. In New Jersey foot-rot is reported in Hunterdon, Salem, Burlington, and Ocean Counties. In the last-named county the disease yields readily to a weak solution of corrosive sublimate.

In Pennsylvania the disease is reported from Mercer, Warren, Washington, McKean, Lycoming, and Westmoreland Counties, but no increase of intensity is marked. In Washington County it is confined to merinoes. In Warren County it was successfully treated by cleaning and paring the hoof and applying strong muriatic acid. In Kent County, Maryland, the foot-rot has been but slightly prevalent. In Lawrence County, Alabama, foot-rot is mentioned. In Galveston County, Texas, the losses from foot-rot amounted to 10 per cent. In Brooke County, West Virginia, about 12 per cent. of the flocks have been affected with foot-rot. In Hancock County 15 per cent. of the flocks have been affected, but the disease is not nearly so prevalent as in former years. In Logan County, Ohio, but 1 per cent. of the sheep were affected, the disease having been almost exterminated by the slaughter, for pelts and tallow, of the unhealthy animals. In one case five thousand sheep were disposed of, the purchaser returning to the seller the pelts and 5 cents per head. In Medina County, however, half the sheep are affected with foot-rot. In Kosciusko County, Indiana, foot-rot affected about 5 per cent. of the sheep, being confined mostly to a few large flocks of merinoes. In Wayne County a few cases of foot-rot were reported, which, it was thought, would be cured by a change of pastures. In Martin County the merinoes lost 20 per cent. In Lenawee County, Michigan, a few cases were reported, but confined

to sheep kept on low, marshy ground. In Sangamon, Du Page, and Whiteside Counties, Illinois, foot-rot was slight. A few died in Scott County. A few flocks in Jackson County, Iowa, were affected.

SCAB.—The scab has been exterminated from Berkshire County, Massachusetts, by removing affected animals and by greater care of the others. In Chautauqua County, New York, it prevailed among a few flocks, as also in Suffolk and Columbia, but not to so great an extent as formerly. It is also mentioned in Sussex County, New Jersey. In Texas the scab is reported as slight in Blanco, Matagorda, Burleson, Austin, Medina, Bandera, and Hunt Counties. It was more serious in Fayette, Nueces, and Uvalde, and in Kendall it affected full half the sheep in the county. In Bandera it was easily cured by an application of carbolic soap or a strong decoction of tobacco. In Missouri the scab was extensive in Henry County and very severe in Benton, causing the shedding of wool. The loss here is about 10 per cent. In Lawrence 20 per cent. of the flocks are affected; in Caldwell, 25 per cent.; in Clinton, 5 per cent. A few cases were reported in Jefferson, while in Barton scarce five hundred sheep were left, although large flocks of eight hundred to one thousand had been lately imported. In De Kalb no flock was free from the scourge. In Coles County, Illinois, scab had prevailed, but was disappearing. It also appeared in Houston County, Minnesota.

ROT.—The rot is prevalent to some extent in Patrick County, Virginia, and is very severe in Scott County, where the loss is fully 10 per cent. of the flocks. In Currituck County, North Carolina, the loss has been 10 per cent. In Buncombe and Wilkes Counties it especially attacks sheep kept too long in small inclosures or on low, marshy lands. Some losses are reported in Ashe County, and symptoms of the disease in Madison County—copious discharge of mucus and blood from the nostrils, &c. Rot is also reported in Kershaw County, South Carolina. In Georgia it prevailed to a small extent in Chattooga County, and was very severe in Franklin, being aggravated by exposure during an unusually severe winter. In Bibb County, Alabama, 25 per cent. of the flocks died. In Amite County, Mississippi, the loss was 10 per cent.; it also did some damage in Pike County. In Polk, Decatur, Sullivan, and Humphreys Counties, Tennessee, rot prevailed to a limited extent, but mostly among sheep poorly sheltered and fed on corn. In Clackamas County, Oregon, a disease, formerly very destructive, has reappeared in great virulence, threatening to sweep the flocks of that State. Its local designation is "leech in the liver." Its first indications are found in a swelling under the chin, which enlarges till it fills the whole space between the bones of the lower jaw. The animal does not, at first, manifest any special uneasiness, but soon it begins to dwindle and finally lies down and dies. A post-mortem examination shows the liver to be infested with leeches and the swollen parts under the jaw to be filled with water.

GRUB IN THE HEAD.—A few cases of grub in the head are reported from Aroostook County, Maine; Le Grand Isle County, Vermont. Superior care has almost extirpated this with other diseases of sheep formerly prevalent. Slight indications of the disease were observed in Albany and Suffolk Counties, New York, and in Kent County, Maryland. A few sheep died in Kosciusko and Crawford Counties, Indiana. An effective remedy was here found in the injection of tobacco tea up the nose.

DISEASES FROM EXPOSURE.—In Accomack County, Virginia, seven-tenths of the lambs were lost by exposure to the severe weather. One-half the lambs dropped in Sampson County also died. In Morgan

County, Tennessee, exposure brought on a new disease among lambs, the prominent symptom of which was a swelling of the head and throat. It was generally fatal. In Barton County, Missouri, scarce five hundred sheep are left, though large flocks of eight hundred or one thousand have been lately imported. In Alameda County, California, excessive recent storms and scanty pasture have caused an increase of 10 per cent. in the losses of sheep.

MISCELLANEOUS DISEASES.—A case of consumption is reported from Aroostook County, Maine, a large fat ewe dying in four days from the first development of the symptoms. In Washington County, Pennsylvania, a few imported Leicesters were attacked with a chronic cough, which, in some cases, proved fatal. Abrupt change of climate was suggested as the cause of this disease. In New Kent County, Virginia, the losses from distemper amounted to 10 per cent. In Randolph County, North Carolina, a few sheep died from eating too many acorns. In Clay County a third of the sheep under a year old died of some unknown disease. In Worth County, Georgia, 25 per cent. died of an unknown disease, indicated by the following symptoms: The animal stands with its head near the ground and occasionally coughs, while a thick, yellow matter exudes from the nostrils, causing constant sneezing. In Fannin County considerable losses resulted from eating bitter mast. In Suwannee County, Florida, an unknown disease destroyed 10 per cent. The sore-head is reported in Pike County, Mississippi. In La Fourche Parish, Louisiana, there was considerable "swelled throat." In Cross County, Arkansas, an unknown disease, similar to murrain in cattle, destroyed 25 per cent. A few died from the same disease in Humphreys County, Tennessee. In Ohio County, Kentucky, the "blind staggers" prevailed to a limited extent. In Allamakee County, Iowa, there were some losses from brain fever. The deaths were very sudden, and no remedy was devised. Our correspondent in Houston County, Minnesota, reports a disease prevailing in his own flock for eight years. It commences with a few pimples under the fore leg where the wool does not grow. It extends gradually, the skin becoming raw over all the uncovered parts of the body. The ulcers emit a very bad odor. Eight or ten, thus affected, were killed.

## DISEASES OF SWINE.

"Hog cholera" is the term indiscriminately applied to diseases of swine generally. A few cases are reported in Westmoreland County, Pennsylvania, among still-fed hogs and hogs confined in filthy pens. The popular remedy here is removal to clean quarters, with free access to rotten wood and bituminous coal. In Baltimore County, Maryland, fifteen hundred died, some farmers losing as many as forty. Much of this loss is attributed to want of proper care. In Rockingham and Rockbridge Counties, Virginia, entire stocks have died in a few localities, but the aggregate loss of the counties is not at all severe. In Scott County the loss is about 33 per cent., embracing some entire stocks. The only known preventive is a mixture of tar and sulphur, fed for some months during the cholera season. In Fauquier County, where the disease was very serious, a mouth wash of tar, turpentine, and chlorate of potassa were effective. Where hogs had access to coal ashes, salt, sulphur, sulphate of antimony, soap-suds, charcoal, or rosin, no disease appeared. In Buchanan and Surry Counties the loss was 5 per cent No efficient remedy discovered. It was thought to have been caused by eating poison mushrooms and unripe berries. Cooked food and tar were relied on as preventives.

Hog cholera prevails in Jackson County, North Carolina, where no remedy is recommended except compulsory extermination of diseased animals. In Randolph County one-fourth of the entire stock were lost. A gill of tar administered in the early stages of the disease was considered a specific. The loss in Buncombe County was 6 per cent., largely brought on by lack of care. In Ash County the loss was 10 per cent. No effective remedy discovered. In Clay County the disease prevailed among hogs less than a year old. Something like "hog cholera" has destroyed 25 per cent. of the hogs of Caldwell County, some stocks losing 50 and 75 per cent. Sporadic cases are reported in Hertford County.

In Clarendon County, South Carolina, on the Santee Swamp, many young hogs have died. In Williamsburgh County some farms have lost their entire stock, but the aggregate loss has not been over 5 per cent.

In Laurens County, Georgia, the loss from cholera was 4 per cent., and a still greater mortality from the "yellow-sweat." Symptoms, a yellow, waxy secretion from the skin, discoloring the bristles, followed by loss of spirits, appetite, and flesh. Great losses are reported in the southern part of Worth County. The animals affected discharged blood freely and vomited dark mucous matter. No specific is relied upon; but common polk-root, fried in grease, is fed to sick hogs. The disease was fatal on some farms in Macon County. Another disease, also called cholera, was destructive. The animals have mange and lice; they grow dull and their bristles turn the wrong way.

In Columbia County, Florida, 25 per cent. died with cholera, and as many more with the "thumps."

In Lauderdale County, Alabama, less cholera than usual is reported. The Berkshire and Essex breeds, lately introduced, are supposed to be of superior hardiness in resisting disease. The cholera prevailed to some extent in Greene and Walker Counties.

In Yalabusha County, Mississippi, 5 per cent. were lost, but by many the loss is attributed to "ticks." In Jasper County there were many deaths from neglect and starvation. Cholera was very fatal in many parts of Lee County. The best preventive is spirits of turpentine mixed with vegetable food. In Clarke County the heaviest loss was from lice.

In Austin County, Texas, the loss was 25 per cent. from different diseases. A swelling and inflammation of the throat was very destructive, causing death from suffocation. Our correspondent successfully treated this disease by burning the skin with a hot iron, producing a counter irritation. He lost half his pigs and shoats by an unknown disease; symptoms, high fever, short breath without cough, death ensuing the second day. In Cherokee County a few cases of cholera occured. In Rusk County many hogs were lost by starvation. In Fort Bend County kidney-worms and mange destroyed 10 per cent. In Upshur County the total loss was a third, mostly from mange.

In Phillips County, Arkansas, a disease arises from eating cockle burrs. In Crittenden County cholera destroyed 5 per cent., and lice a still larger number.

In Obion County, Tennessee, there was a loss of 20 per cent.; cholera always prevails in years of a heavy beech-mast. In such cases a worm is found in the intestines 10 or 12 inches long, which sometimes eats its way through the bowels. It is remarkable for its keen, black head. The remedies used are salting, slopping, copperas, alum, and sulphur. In Hickman County the loss was 10 per cent.; when sulphur, copperas, or leached ashes were freely used there was little disease. In Davidson

County cholera was fatal in some localities, but starvation destroyed a still larger number. Probably two-thirds of the sows lost their litters in January and February of this year. In Humphreys County there was a loss of 30 per cent. among shoats, and 25 per cent. among grown hogs. All hogs affected were lousy. Solutions of lye and copperas were given with enough bran to make a mush. Sulphur, charcoal, and coal-tar were also used. External applications of coal-oil, coal-tar, lard and sulphur were effective in destroying lice. No general specific, however, is reported. In Madison County the disease made a clean sweep, and no effective remedy could be devised. Its virulence was attributed to neglect and to access to cotton-seed. In Jefferson County it almost broke up hog-raising. The stock of hogs some years ago in the county was seventy thousand, but now the whole number is between four thousand and eight thousand. In Sullivan County there was a loss of 7 per cent. from swelled throat, thumps, and other diseases, all of which are popularly called cholera.

In Hardin and Christian Counties, Kentucky, the losses amounted to 33 per cent. The loss in Meade and Ohio Counties was 20 per cent., and in Pendleton County, 25 per cent. Ten per cent. loss was reported in Pulaski, McCracken, Warren, and Edmonson Counties, and 5 per cent. in Adair and Boyle Counties. In Marion County 5 per cent. of the hogs died from lice and worms. In Laurel, hogs from without the county wintered upon the heavy mast, nearly all died, but no others. In some counties it was found that hogs allowed free range for roots entirely escaped. The disease raged in Graves County; it destroyed 15 per cent. in Daviess, where it has prevailed ever since 1858. In Breckinridge the losses amounted to 16 per cent.

In Berkeley County, West Virginia, the losses were alarming, amounting to 60 per cent. In Jefferson County the losses were between five thousand and six thousand, valued at $25,000. In Berkeley the affected animals exhibited excrescences on the snout, legs, and other parts.

In the wet lowlands of Hamilton County, Ohio, a few cases of cholera are reported. In Clinton County it was quite fatal, destroying two thousand. In Williams County a new and fatal disease is reported among young pigs; they become stiff and die in twenty-four hours.

One-third of the stock of Gibson County, Indiana, died. Great mortality occurred in Warwick County, all diseases being confounded under the general name of cholera. The hog-raising business is much depressed by heavy losses. In Decatur County the loss was 10 per cent. Alum, sulphur, copperas, madder, black antimony, and saltpeter pulverized and mingled with wheat, oats, or barley, were found beneficial, the mess being eaten with avidity. The losses amounted to 10 per cent. also in Johnson, Wells, Greene, Spencer, Knox, Posey, and Huntington Counties. Losses to the extent of 5 per cent. are reported in Carroll, Newton, and Scott Counties. In Vevay, Switzerland County, a distiller lost $10,000 worth of hogs, but the losses of the farmers were small. In Hamilton County the loss was 3 per cent. In Cass County it was remarked that all of the few losses occurred in the heavy timbered country, and none in the oak openings.

In Wabash County, Illinois, the loss amounted to 10 per cent. Our correspondent lost 60 per cent. The disease is less destructive than formerly in Williamson and Hancock Counties; cooked food and plenty of charcoal has been found a good preventive. In Champaign County a few cases occurred in the timbered section. In Fulton County 20 per cent. of last spring's pigs died. In Sangamon County 20 per cent. died;

and in Coles County 15 per cent., mostly stock hogs, weighing from 50 to 100 pounds each. In Peoria County no cases of cholera are reported, but hogs were dying of a peculiar disease, which commenced with trembling, like a violent chill, after which loss of appetite and stupor supervened; in a day or two the animal became unable to stand, and died in three or four days. One hog, removed from the pen to the sunlight and rain, and dosed with copperas, recovered. His recovery is attributed more to his release from confinement than to the drug. In Alexander County the loss was one-fifteenth. In Morgan County the losses were severe, but the disease did not appear to be epidemic. In Macon, Marshall, and Henderson Counties the loss was 10 per cent. In Menard County the loss of pigs and shoats was 40 per cent., and 20 per cent. among the older hogs. In Wayne County the loss was 20 per cent. In Warren County a third of the young stock hogs died. Quinsy is reported in Bureau County. In the river-bottoms of Pope County the losses amounted to a third of the whole. In Cass, Carroll, and Whitesides Counties the loss was but 5 per cent. Better care is taken of hogs than formerly. In Scott County the losses amounted to 30 per cent., and in Clinton County 25 per cent. In Massac one-twentieth of the hogs died. Our correspondent in Ogle County states that a specific was found in a mixture of eight bushels of lime to a barrel of salt, to which the hogs should have free access.

In Chariton County, Missouri, there was a loss of 40 per cent.; the mortality was especially severe among pigs and shoats. In Holt, Stoddard, Cass, Pettis, and Livingston Counties, the losses were not over 5 per cent.; in Platte, Butler, and Maries Counties, the loss was 10 per cent. In Saint Louis County, some localities lost from 40 to 60 per cent., but the loss of the whole county was not over 2 per cent. Andrain County lost 25 per cent. A few hundred hogs died in Polk, Mercer, Lincoln, McDonald, Lancaster, Carroll, and Boone Counties.

In one locality of Kent County, Michigan, 50 per cent. of the hogs died. No other cases reported in Michigan, and none in Wisconsin, Minnesota, Oregon, or California. A loss of 5 per cent. is reported in Nemaha County, Nebraska. The disease prevailed to some extent in Leavenworth, Linn, and Doniphan Counties, Kansas.

Quinsy prevailed in Greene County, Iowa. The losses amounted to 20 per cent. in Warren and Lucas Counties; to 10 per cent. in Tama, Brown, Jefferson, Marion, Dallas, Louisa, Madison, and Clarke Counties; to 5 per cent. in Dubuque and Jasper Counties. In Benton County, 25 per cent. died of cholera, and 10 per cent. of quinsy. In Henry County the loss of pigs and shoats ranged from one-half to two-thirds. Losses were very heavy in Mahaska and Mills Counties.

The only loss from cholera reported from the Territories is one from Iron County, Utah, amounting to 1 per cent.

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## THE SUGAR-BEET IN SWEDEN.

The following communication to the State Department has been transmitted to this Department by Hon. Hamilton Fish, Secretary of State. As a statement of the progress of sugar manufacture in a very high latitude, and an evidence of the gradual extension of the business into new fields, it will be read with interest in this country:

LEGATION OF THE UNITED STATES,
*Stockholm, December 29, 1871.*

SIR: Accompanying my No. 50, of May 19, 1870, I had the honor to send to the Department some facts on the manufacture of beet-sugar in Sweden.

Having recently learned that attention was being directed to this important industry in certain of the Northwestern States, where the winter climate is similar to that of Sweden, I thought, inasmuch as the business succeeds here, it would be useful to collect and transmit to the Department the latest information on the subject which Swedish manufacturers could furnish. Accordingly I addressed some inquiries to Mr. J. Franchell, one of the principal proprietors of the oldest beet-sugar factory in Sweden—that at Landskrona—who is thoroughly acquainted with the business, and received from him, under date of the 6th instant, a very full reply, from which I beg to make the following extract:

"The land which we occupy ourselves varies very much in character, say from light, sandy loam to rather stiff clay; both extremes not very propitious to the cultivation of the beet-root, but the greater part consists of rich loam, very suitable to the purpose. The whole of the land, about 1,800 tunn, (say 2,000 acres,) has been drained with pipes, 4 to 4½ feet deep, and cultivated to the depth of 16 to 18 inches.

"Through the liberal application of stable manure to the cereal crops, and artificial manure, chiefly super-phosphates and potash, the latter derived from burning the residue of the beet-root molasses used in the spirit distillery, to the root and leguminous crops, the land is now brought to a high degree of fertility. In land brought into this state there will, of course, always be a good deal of soluble saline matters, but our land does not contain such matters in excess, or in a degree to act injuriously to the quality of the beet.

"On our principal farm we use a five years' rotation, say, 1, wheat and rye; 2, beet root; 3, barley and oats; 4, clover (seed is sown with the barley) and mixed grain; 5, clover and green crops; consequently the beet-root only returns every fifth year. Having, however, some reason to suspect that the cultivation of beet-root and clover in so short a rotation is not favorable to the former, we have adopted, as a trial, on a small farm, a four-course rotation, say, 1, wheat and rye; 2, beet-root; 3, barley and oats; 4, green crops, clover being entirely excluded. Fifteen to seventeen tons per tunnland (1.22 acres) may be considered an average crop.

We pay 80 öre per centner, or about 21*s.* 4*d.* per English ton delivered at the works at the time the harvest is made; but growers who keep the beets until wanted at the works are paid a few öre more, according to the time of delivering. At 80 öre, the gross income, calculated on the above-mentioned weights, will be 288 to 326 rix dollars per tunnland, and the cost of cultivation may be reckoned, in round numbers, at 100 rix dollars per tunnland. [At this rate the profit of growing beets would be from $45 to $55 per acre in gold.] We have hitherto experienced no particular difficulty in protecting the beets from frost. They are not put in pits, but on flat land, in small roof-like heaps, containing five or six wagon loads, and protected at first with only a thin covering of earth to prevent overheating, which is very injurious to the saccharine matter, but later in the season with a thicker covering up to, in all, 24 inches, according to the length of time the heaps are expected to remain in the field. [To the question, 'How many months of the year is the factory occupied in making beet sugar?'] Generally from the commencement of October to the beginning or end of February. The remaining part of the year is occupied in refining beet-root and colonial sugar. During the autumn and winter months the beet roots give the best results, and they deteriorate rapidly in February and March.

"As we not only manufacture beet-root sugar, but also largely refine beet-root and colonial sugar, it is rather difficult to state exactly the amount of profit on the beet-root manufacture; but this manufacture, being at present exempt from all duty, the import duty on colonial sugar being 1¾*d.*, English, per cwt., it must be exceedingly profitable if carried on where the circumstances are naturally favorable. The refuse is a most excellent food, and we use it largely both for fattening cattle, milch cows, and sheep. It is mixed with cut straw and put in a heap for about twenty-four hours, to acquire some heat, and it is then eaten with avidity.

"The success of the beet-root business must, in the long run, entirely depend on the quality of the beets, and also on climatic influences. Exceptional circumstances, such as, for instance, exemptions from duty, may, of course, enable this business to be carried on tolerably well, even with inferior beets, and under an unfavorable climate, but it may be subject to doubt whether such business can be considered legitimate, and be able to hold out in competition with the foreign manufacture when the duties shall be measurably equalized. Eleven or twelve per cent. may be considered the average of sugar in the beet juice in this part of the country. This year the beets are rather above the average quality, but of course they vary a good deal, according to the mode of culture and state of the weather during the period of growth.

"The seed is always sown by us on the field direct, and I do not believe that at present transplanting is anywhere resorted to. In sowing by hand, which is a good deal practiced both here and in Germany, the field is rolled very evenly, the earth being in a high state of pulverization, and then the rows, lengthwise and across, marked out with a marker like a colossal hand-rake. By means of a small hoe, with a handle about 12 inches long, a hole about one inch in depth is made in each cross, four or five

seeds therein deposited, and the earth replaced and gently pressed with the back of the hoe. The sowing by hand is considered to have several advantages. The plants then grow up in a small bush, thereby easier penetrating the crust which may have been formed by heavy showers of rain, and protecting each other in case of rough weather during the early period of vegetation. The rows can then be made narrower, which is considered favorable to the development of the sugar, but it requires a great deal of labor; but during the last few years, having found it more difficult to supply the necessary labor to the large breadth cultivated, we have largely, and with very good success, made use of machines both for sowing and hoeing. In sowing by hand the plants generally have a distance of 12 inches each way, but in sowing by machine the rows have a distance of 16 to 18 inches, and the distance between the plants in the rows 9 to 10 inches. We principally use Ganet's common drill machine, not having found the Dibble machines quite practical. The quantity of seed used per tunnland is 18 to 20 pounds with hand sowing, and 22 to 25 pounds when sown by machine.

"The beet-root requires rather a long period of growth for getting fully ripe. The land, having been plowed deeply in the autumn, is prepared in the spring as early as the state of the weather will permit, by us generally in the early part of April, and the sowing performed during the latter half of that month, or, under less favorable circumstances, in the early part of May. The crop is not ripe before the early part of October. The harvest comes on in the course of that month, being hardly finished before its close, or the first days in November.

"I am not aware of any important improvements in the art of manufacture during the last two years, but I believe that several minor improvements have been introduced in the manner of working the new system of extracting the juice by diffusion with water, a system which, during the last few years, has excited a great deal of attention on the part of manufacturers of beet-root sugar, and appears on the whole to give great satisfaction.

"The method of analyzing the juice in general practice is the same which is generally adopted in Germany. It is weighed at a temperature of 17½° C. by the saccharometer of Brix, and then polarized by the instrument of Soleil-Wartzke, with improvements by Dr. Scheibler, to arrive at the proportion of crystaline sugar contained in the juice. The difference between the degrees observed on the saccharometer and those on the instrument of polarization is considered as impurities, and is called 'no sugar,' and the proportion in which the latter degrees stand to the former is decisive of the quality of the juice. Thus, if the saccharometer marks 14° and the polarization gives a result of 11°.5, the difference, 2°.5, is 'no sugar,' and the quotient being 82.14, indicates the relative quality of the juice for sugar-making purposes. The beet-root crop of this year has not turned out quite so abundant as last year, chiefly owing to the cold and unpropitious weather in the spring, by which field operations and vegetation were very much retarded, but the quality of the beet is considered superior to that of last year's crop.

"There is at present a very active movement in this country with regard to the beet-sugar business, and a very remarkable thing is that this activity appears to have been stirred into life by the impending taxation of the manufacture. For a number of years our factory was the only one in the country, but as soon as a proposal had been made in the Diet of 1867 to put a duty on indigenous sugar, a proposal which, in a modified form, was ultimately carried in the Diet of 1869, a new vigor seems to have been infused in the business, and, besides ours, there are now at work one factery in Stockholm, one near Malmo, one at Halmstad; and two are in course of construction, one at Wadstena, which is expected to get to work in January, and one near Ystad, which will not commence operations before next autumn. The factories at work will probably this year consume 700,000 to 750,000 centners, Swedish, of beet-root, (say 30,000 English tons,) and I think a rapid increase in this quantity may be looked for. A great advantage to those who now establish factories is that they can profit by the long, dearly bought, and widely extended experience of other countries, and construct their works according to the most approved system.

"Possibly Sweden enjoys a certain advantage over some of the interior and Northwestern States of the United States, in being able to receive shipments direct by sea of colonial or West India sugar, the refining of which occupies the factories while they are not engaged on beet-root sugar.

"The Diet three years ago provided that a tax should begin to be applied to white beet sugar in 1872, at the rate of 2 öre per skålpund, (about one pound,) at which rate it is to remain for three years; the next three years following it is to be 4 öre per skålpund and so on increasing 2 öre per skålpund every three years until it reaches 8 öre (say 2¼ cents) per skålpund, at which amount it is to remain; which is four-fifths of the present duty per skålpund on colonial raw sugar up to No. 18, Holland standard.

"I have several times visited the factory at Stockholm, and every facility for acquiring information as to its operations has always been courteously afforded to me. It was established in 1869, with a capital of $111,000, (gold,) which paid for some land,

the new factory buildings, and the machinery. Cost of machinery, $67,000. Capacity of the factory, 10,000 tons of beet root per season. None of the owners were practically familiar with the business, and some loss has been sustained from lack of proper management. The proprietors, however, have full faith in its success, and are investing considerable capital in one or more new factories. They were led to expect, this season, a supply of 10,000 tons of beets, but got something less than half that quantity; and the beet 'campaign' lasted only one-and-half months. The beets were of excellent quality, and those who grew them have *cleared* about $100, gold, per acre. The danger of frost before the beets are fully ripe is a difficulty to be met with here.

"The factory at Landskrona and at Stockholm together, in 1870, manufactured one and a half million pounds of beet sugar, of the value of $180,000, besides molasses, of the value of $5,000.

"It is well known to what a high standard agriculture has been carried in England. And yet Mr. James Howard, the distinguished English agriculturist, ascertained by personal observation of sugar-beet growing in France *that the profit on the crop was far greater than upon any crop grown in England;* and he so expressed himself in 1868, in a note to the president of the Royal Agricultural Society of England, in which he recommended the sending of a deputation to visit the best farms on the continent.

"In 1869 Mr. Howard made an extensive tour on the continent, particularly to acquire information on this subject, and in 1870 published the result of his observations, in a highly interesting and instructive volume of about 100 pages. In France he visited several farms, which had taken the premium of honor (valued at $1,600) in their district, and which, he says, are exerting a quiet but powerful influence in their respective neighborhoods. Among these was a farm at Lens of 1,200 acres, of which 500 acres were in beet root, all on ridge, without a single blank spot; the yield estimated 18 tons per acre. The land had been plowed 16 to 18 inches deep. There had been a sugar-factory on the farm for many years. Another farm near Tours had 1,250 acres of beet root, beautifully cultivated, the rotation being, 1, wheat; 2, beet root; 3, clover. At Chassart, near Fleurs, in Belgium, on a farm of 1,500 acres, he saw one splendid field of sugar-beet of 175 acres, which was estimated at over 20 tons an acre. He shows that, owing to the influence of sugar-beet factories in Belgium, the annual rent of farms have risen to, in some cases, $17 per acre. The Rhenish beet-root sugar company at Cologne have a farm of 7,200 acres. They pay the surrounding farmers 20*s.* per ton for beets, and give back the pulp free, the average price of which, on the continent, is 13*s.* per ton. He was shown the debtor and creditor account of a beet-sugar factory, which manufactures into sugar between 13,000 and 14,000 tons of roots per annum. The total expenditure, exclusive of the interest upon the money embarked, was $94,000; the total receipts about $160,000, leaving $66,000 per annum for profit and interest on capital.

"There must now be over a thousand beet-sugar factories in Europe.

"While both the manufacture of beet sugar and the growing of the beets are seen to be profitable, it would seem, however, that the *peculiar advantage* of the industry to a country is its *influence in diffusing a skillful practice of farming* and of promoting agriculture in general. To show the appreciation in which it is held in France, Mr. Howard states that, at an agricultural meeting held a few years ago at Valenciennes, a triumphal arch was erected, on which appeared the following inscription: 'The growth of wheat in this district, before the production of beet-root sugar, was only 976,000 bushels; the number of oxen was 700. Since the introduction of the sugar manufacture the growth of wheat has been 1,168,000 bushels, and the number of oxen 11,500.'"

As to the steps that will promote this business in the United States, I would submit that, before any one would be willing to invest capital in starting a factory in an untried locality, he would wish to ascertain whether the soil in the neighborhood will produce beets having a sufficient percentage of sugar in the juice to make it profitable. Doubtless this essential fact can be ascertained by growing the beets on different farms a couple of successive seasons. Some person, who purposes trying the manufacture, should see to procuring seed in time and to its distribution, with instructions as to the best manner of growing. He should also make arrangements in season for having the beets analyzed at some beet-sugar factory promptly after they are ripe, and for their careful collection, labeling, and transportation to the place of analyzing.

It seems as if it would be for the interest of some of the land-grant railroad companies to cause experiments to be made as to the adaptability of their lands for sugar-beet growing.

Where a factory is to be established by persons unacquainted with the art, practically, it is of the highest importance, of course, to procure for manager a faithful as well as competent person. It sometimes happens that men are recommended for situations to get rid of them. And I would suggest, as the best plan, that, in case the proprietors of any new beet-sugar factory in the United States need to send to Europe for a manager, they apply to the *government* of the country from whence they expect to obtain him, through the good offices of the Department of State

Hoping the success which attends this industry in Sweden will help to encourage its increased development in the United States, I have the honor to remain, very respectfully, your obedient servant,

C. C. ANDREWS.

Hon. HAMILTON FISH,
*Secretary of State, Washington.*

# ENTOMOLOGICAL RECORD.

BY TOWNEND GLOVER, ENTOMOLOGIST.

THE CABBAGE-MOTH.—Complaints have been made by correspondents in New York and New Jersey of injuries done to cabbages in the autumn by the attacks of a small, green caterpillar, that eats holes in the outer leaves, sometimes riddling them like a seive. The caterpillar is about 0.35 of an inch in length, cylindrical in form, thickest in the middle, and of a green color. The moth produced from it was named *Plutella limbipenella*, by Clemens, (Fig. 5,) and is described by Dr. Fitch in the New York State Agricultural Report for 1853, page 874, as the cabbage-moth, *Cerostoma brassicella*, and is closely allied to, if not synonymous with, *Plutella xylostella*, Linn., in Europe; and if so, is another imported insect. When disturbed, this caterpillar drops from the plant, but suspends itself by means of a silken thread. There are at least two broods in one season in the more southern States. In the fall of 1870 it was very plentiful in parts of Maryland, riddling the cabbages very seriously. The pupa is formed in a beautifully constructed cocoon, woven of silk-like delicate open net-work on the leaves, and remains a pupa in the cocoon only a few days. The perfect insect is a small moth, with the upper wings of an ash-gray color, freckled on the disk and apex with black dots, and having a white stripe on the inner margin; the under-wings are ash-gray.

Fig. 5.

Washing or syringing the plants with whale-oil soap-suds or strong solutions of tobacco-water would no doubt be of use, if they did not give the heads a disagreeable flavor, or if the cabbages were subjected to a thorough washing before using. The insect is subject to the attacks of a minute ichneumon fly; and the two spiders, *Theridion brassicæ* and *hypophyllum*, mentioned by Dr. Fitch in his last report in connection with the white cabbage butterfly, will also, no doubt, be of service in destroying the small caterpillar.

# CHEMICAL NOTES.

BY RYLAND T. BROWN, CHEMIST.

The laboratory is now employed in the analysis of commercial manures, with a view of determining the relative value of these commodities, that those who purchase and use them may have something to guide them in their choice. These analyses will appear from year to year in the annual report of the Department. But little work, other than this, has been done since the last report, and of that little scarcely any is of sufficient general interest to justify publication. A specimen of calcareous

tufa, (commonly called marl in the West,) was forwarded to the laboratory by S. W. Randall, of Joliet, Illinois, and we subjoin its analysis because such deposits are quite common in the calcareous and drift regions of the Northwest.

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|---|---|
| Carbonate of lime | 81.43 |
| Sulphate of lime | 4.21 |
| Earthy matter, insoluble in hydrochloric acid | 12.02 |
| Water, determined at 100° C. | 2.34 |
| | 100.00 |

Mixed with muck or barn-yard manure, this substance will have the effect of mild lime. Where fuel is cheap it may be made more active by burning it as lime is burned.

SULPHUR IN MINERAL COAL—OHIO LIMESTONES.—Professor Wormley, in a paper appended to the Ohio Geological Report for 1870, gives an interesting account of the chemical composition of the mineral coals and limestones of that State. Without any very accurate determination of the fact, it has heretofore been assumed that the sulphur in bituminous coals exists in combination with iron in the form of ferrous sulphide, but the investigations of Professor Wormley prove conclusively that this is not the case, at least so far as the coals of Ohio are concerned. In all his investigations a large redundancy of sulphur over the quantity of iron necessary to convert it into a sulphide was found. The experiments detailed on the heating properties of different coals are very interesting. Science can hardly do a more important service, at the present time, than to determine how much heat can be produced by the combustion of a given weight of coal of the various qualities. This paper reports that all the limestones of Ohio contain magnesia, though in very different proportions. The blue limestone (Trenton) has 5 per cent., the Clinton 12, the Corniferous 28, and the Niagara 35. These facts are important in an agricultural point of view, but we regret that the professor did not determine the proportion of phosphate of lime in these several qualities of stone. The permanent action of lime as a manure depends much on the quantity of phosphoric acid it may contain.

ARTIFICIAL WATER-LIME.—It has been long known to chemists that water-lime consists substantially of quick-lime, burnt clay, and a small portion of the oxides of iron and magnesia, but scarcely any effort has been made to utilize this knowledge. All yellow or red clays contain iron, and most specimens of lime in use contain the required magnesia. If burnt clay or brick-dust in fine powder be mixed with an equal weight of fresh slaked lime and twice this weight of clean, sharp sand be added, a compound will be formed which will harden under water equal to the best hydraulic cement.

GERMINATION—ITS RELATION TO LIGHT.—The theory of the germination of plants, which has been heretofore admitted, requires that the germinating seed be excluded from direct sun-light. Late experiments appear to establish the fact that, while exclusion from the luminous rays of the solar spectrum is necessary to the healthy germination of seeds, yet the chemical or actinic rays are indispensable to that process. These penetrate much deeper into the soil than do the luminous rays. The exclusion of the chemical rays, and not the absence of oxygen alone, is assumed to be the cause of seeds failing to grow when buried too deeply in the earth. Will our agricultural colleges settle this question

by careful experiments? Let us have all that can be known of the mysteries of plant-life.

CARBOLIC ACID AS A DISINFECTANT.—C. Homburgh, of Berlin, proposes to use carbolic acid as a disinfectant, by saturating sheets of Bristol-board, or any thick spongy paper, with a solution of carbolic acid in water. The paper, in pieces of any convenient size, may be hung up in the room to be disinfected, or may be placed in drawers or wardrobes, where it is desired to protect clothing from moths or other insects. This suggests a convenient method of using this excellent disinfectant and insect destroyer.

AVAILABLE NITROGEN.—P. P. Deherain (in *Comptes Rendus*) advances a somewhat novel theory of the reduction of atmospheric nitrogen to an available form for the support of plant-life. He endeavors to prove that the free nitrogen of the atmosphere is brought into combination during the oxidation of organic matter in the soil. To demonstrate this he dissolves glucose in a dilute solution of ammonia in water placed in a large flask filled with a mixture of equal parts of nitrogen and oxygen. Having closed the flask, he heats the mixture gently for one hundred hours, at the end of which time the whole of the oxygen has disappeared, and 5.9 per cent. of nitrogen has been taken up. The same process with humic acid and potash shows a loss of 7.2 of nitrogen. If these results are confirmed by subsequent experiments, they will throw light on the hitherto obscure subject of the production of nitric acid.

FORMULÆ FOR FERTILIZERS.—M. George Ville, in the *Journal d'Agriculture Practique* for February 22, 1872, gives the following formulæ of chemical manures at present in use in France, with the modifications which he proposes to introduce, to which he appends the prices of the several ingredients used in the compound, both in the old formula of 1868 and the new of 1871. By way of explanation to some of our readers, it may be proper to say that a kilogram is equal to 2.204737 pounds—a franc is a value of 18.6 cents, and a hectare is a land-measure of 2.4711 acres.

*Old formula for clover and hay.*

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|---|---|---|
| Acid phosphate of lime | 400 kilograms | = 64 francs. |
| Nitrate of potassa | 200 kilograms | = 124 francs. |
| Sulphate of lime (plaster) | 400 kilograms | = 8 francs. |
| | | 196 francs. |

Cost per hectare = 196 francs, or $36.45.

For which he substitutes the *new formula* with the prices of 1871 appended:

| | | |
|---|---|---|
| Acid phosphate of lime | 400 kilograms, | worth 52 francs. |
| Chloride of potassium | 200 kilograms, | worth 50 francs. |
| Sulphate of lime | 400 kilograms, | worth 8 francs. |
| | | 110 francs. |

Cost per hectare = 110 francs = $20.46.

For clover or Burgundian hay, M. Ville says he does not hesitate to recommend the chloride of potassium as a substitute for the nitrate, but for cereals (wheat, rye, barley, &c.) it is necessary to supply nitrogen in some available form, and for this purpose he uses the sulphate of ammonia as in the following formula:

| | | |
|---|---|---|
| Acid phosphate of lime | 400 kilograms, worth | 52 francs. |
| Chloride of potassium | 200 kilograms, worth | 50 francs. |
| Sulphate of ammonia | 390 kilograms, worth | 195 francs. |
| Sulphate of lime | 210 kilograms, worth | 4.20 " |
| | | 301.20 frs. |

Cost per hectare = 301.20 francs = $54.52.

By the term "acid phosphate of lime" we suppose the author means bone meal or ground mineral phosphate of lime, reduced to a soluble form by the addition of half the weight of sulphuric acid.

The Feuilleton du Journal des Débats of February 7, 1872, gives an account of several institutions throughout Germany, France, Italy, and other parts of Europe, which are said to render very great and efficient service to agriculture. They are styled agricultural stations, and have for their object the promotion and diffusion of agricultural science, and the protection of practical farmers from frauds practiced upon them by dealers. To attain this object they devote themselves to the prosecution of different experiments in vegetable and animal physiology, the analysis of soils and fertilizers, and all the different products which are presented to them by the practical husbandman. They have a double mission imposed, that of being both theoretical and practical; they must work up the scientific theories and discoveries and put them in such a shape as to be understood and utilized by farmers. A much better idea of their object will be conveyed by giving the different heads into which M. Grandeau has grouped the work pursued by the different stations. They are as follows:

1st. Researches and experiments upon the production of vegetables and animals. The word production is here taken in its broadest sense. It comprehends at once the researches upon the different branches of animal and vegetable physiology, zootechny, physiological chemistry, and vegetation meteorologically considered.

2. Informal lectures involving the principles of agricultural science, and communicating results of work in field and laboratory.

3d. Publication of the successful labors of the several stations in annual or periodical reports.

4th. Special researches and analyses of earth, water, and fertilizers, for their peculiarities.

Further, there are stations which devote themselves to examinations not less necessary than those of fertilizers, viz: that of seeds. The stations devote themselves to the study of the laws which regulate the development of all organized beings. But, says M. Grandeau, in order to do this with success they should not only be provided with sufficient means and material, but should also be directed by men of tried capacity, versed in the knowledge of the natural sciences, and prepared by special studies for the accomplishment of the important mission confided to them. In the last connection, he says one should not undertake this without the expectation of repulse. In the beginning all the stations devoted themselves to the general study of animal and vegetable physiology, but finding the field too comprehensive, they concluded that it would be much more profitable to make a division and specialization of the work. After that they each, having a particular subject assigned them, occupied themselves with different branches. Thus the stations of Weisbaden and Kloster-Neubourg devote themselves to grape culture and wine manufacture; those of Brunswick and Mariabrunn to wood culture; those of Gorze to silk culture. The sta-

tion of Lodi devotes itself to researches upon the manufacture of cheese; and those of Parvi to the study of cryptogamic botany.

The author begs leave, in order to convey a more perfect idea of this great labor enterprise, to make some extracts from the programmes of researches prosecuted at the different stations. The following are some of the questions to the solution of which the stations of Kuschen and Proskow will devote themselves during the current year:

1st. Essays upon culture in aqueous solutions relative to the assimilation of ammonia, urea, and hippuric acids.

2d. Experiments upon the amount of water evaporated by different plants.

3d. Researches upon the influence exerted by the volume of earth upon the development of different plants.

4th. Trials on the culture of plants and of new varieties.

5th. Trials of different manures, having for their sole object the determination of the different combinations of nitrogen.

6th. Estimation of the richness of stubbles and roots in mineral matter and nitrogen.

7th. Researches upon the mixed seeds of the red clover, of Lucerne, or Burgundian hay, of esparcette, and the grasses.

8th. Researches upon the digestibility of stubbles, the nutritive elements contained in young clover, old clover, and in Lucerne hay.

9th. Researches and experiments upon the different modes of the preparation of hay.

10th. Comparative researches upon the utilization of the nutritive elements of Lucerne as it is usually prepared, and of brown.

11th. Researches upon the feeding of dry clover with the addition of different nutritive substances.

The stations publish every year the programmes of their researches and experiments, and very materially enrich science with many valuable discoveries. But their popularity is chiefly due to the analyses of fertilizers and the controlling influence they exercise over their trade. The prices of analyses are fixed, by the founders of these institutions, sufficiently low to encourage customers, and yet cover the expense and leave the station a small allowance. This prevents the sale of worthless material by dishonest manufacturers, and protects the honest dealers as well as the farmers who use the productions.

In France this abuse by manufacturers of fertilizers became so great, and so burdensome to agricultural industry, that they endeavored to prevent it, and founded laboratories charged with the examination of commercial fertilizers. Among these laboratories that of Nantes, conducted by M. Bobierre, has rendered the greatest service to agriculture. But unfortunately they are not sufficiently numerous to be everywhere efficacious in aiding the husbandman. The agricultural societies therefore decided that analytical laboratories should be established in every district. They further demand that information shall be given to the minister of agriculture concerning the exact state of the soil which they cultivate, and the nature of the fertilizer used upon it.

The method of inspecting commercial fertilizers practiced throughout Germany is conducted in the following manner: After the manufacturer has prepared a certain quantity of the fertilizer, the chemist goes to him unexpectedly, has him weigh in his presence the sacks destined for sale. He then takes a quantity which he deems necessary, makes an analysis of it, and publishes its composition.

But there are stations devoted to the investigation of a matter equally important with that of fertilizers. It is the examination of the differ-

ent seeds offered in large quantities in the markets. The imperfect and foul seeds which they very often contain make them a source of great annoyance to the planter. The examination of seeds, therefore, is highly beneficial. The stations provide experts who continually carry on these examinations of all the seeds offered for sale, which, if they are bad, they condemn, and publish the amount of their adulteration. To show the great importance of this measure, as well as the very great extent to which these adulterations are carried, it is stated that Mr. James Buckman, formerly professor in the agricultural college of Cirencester, England, who is occupied with the examination of different seeds, found that certain specimens of red clover of commerce contain from 7,000 to 8,500 grains of foul seeds per liter. Specimens of white clover showed 125,000 to 213,000 grains of strange seeds per liter; while in an equal quantity of carnation clover, guaranteed pure, he discovered 43,500, and in ray grass of Italy, 430,800.

Mr. Charles S. Bigge found in his determinations upon the germination of seeds that in different specimens of carnation clover the number of grains which grew varied between 18 and 68 per 100; white clover furnished 42 to 48 per cent. of good grains; the ray grass of England, 22 to 24 per cent.; and he found that in a specimen of ray grass of Italy only six retained their germinating faculties. Other instances of adulteration and presence of foul and useless seeds in the articles offered in commerce were cited, but enough have been given to show the enormous extent to which this evil is practiced, and the very great value to the farming community of this branch of investigation.

All the researches and experiments of the stations are very thorough and complete, and therefore of almost infinite value to the practical farmer. This fact, together with the vast amount of valuable information which they render to the scientific world, should favorably recommend their establishment in every section where agricultural industry is practiced.

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## FIRST WORDS OF THE BOTANIST.

By George Vasey, Botanist.

The present botanist of the Department having but just entered upon his duties, no extended report of operations is possible.

A great amount of work has been accomplished by my predecessor in putting up and arranging the botanical collections of this Department. A large portion of these are distributed in the cases, on appropriate shelves, numbered in order from 1 to about 200, corresponding to the natural orders. Large quantities of specimens yet remain in packages, awaiting examination and distribution, and the mounting of such as are not yet represented in the general herbarium.

Here are deposited the botanical collections of the different exploring expeditions of the Government, together with the numerous private collections which have come into its possession. Here should be a representative of every species of plant growing within the United States, and, as far as practicable, of the plants of other countries. Although a large portion of these specimens have but little popular interest, they are of great value to the cause of science, as showing the relationship between different families of plants, recording their geographical range and distribution, and furnishing a means of comparison

and recognition of such plants as are often sent in for identification. Thus, specimens of grasses and forage plants are frequently sent to this Department by farmers and others on account of some special qualities of excellence or adaptation to the peculiar conditions of some location in which they have been observed to grow.

In connection with the ordinary botanical specimens, it would seem to be highly desirable to have a more complete representation of all our native forest-trees, in the form of sections of the trunk or body of the trees, in such form as to illustrate the natural appearance both of the bark and of the wood—a section of the wood being also polished, to show the quality of the grain and its adaptation to mechanical purposes. Such a collection, properly prepared, would prove of great interest not only to science, but to practical agriculture and mechanics, and would tend to show how rich are our native forests in the variety and value of their trees for various purposes in the arts and manufactures.

This feature of the work would also have a practical bearing upon the important questions now agitating the public mind, viz: The preservation and perpetuation of the forests of the country. Every means possible should be employed to diffuse information on this subject, and thus promote national wealth and prosperity.

Another object of great importance to the country is the diffusion of information respecting the vegetable or fungoid diseases which affect many of our most valuable agricultural products. Our grains, our orchards, and vineyards in many localities are suffering from the ravages of blight, mildew, mold, rot, or other fungous parasites. These require investigation, in the expectation that a full knowledge of their nature and habits of growth will enable us to discover means of arresting and controlling their progress.

In conclusion, I will express the hope that the value of this collection to the cause of science will not be overlooked.

To a casual observer there may not appear any connection between the multitude of specimens arranged in the cabinet of the naturalist and the cause of agriculture. To the inexperienced hundreds of these specimens appear identical. But all intelligent persons are aware that it is only by virtue of an intimate knowledge of the multiplicity of forms which crowd every department of science, and of the relations and affinities which they sustain to each other, that the specialist is enabled to recognize and classify the various objects which come to his attention. It is this special knowledge which enables the botanist to recognize a new grass or other plant, and to judge what may be expected of it as an object of cultivation.

Indeed, at the present day, it cannot require much argument to show the influence of science on mental culture, and consequently on national elevation, in other respects than those which relate to immediate pecuniary profits.

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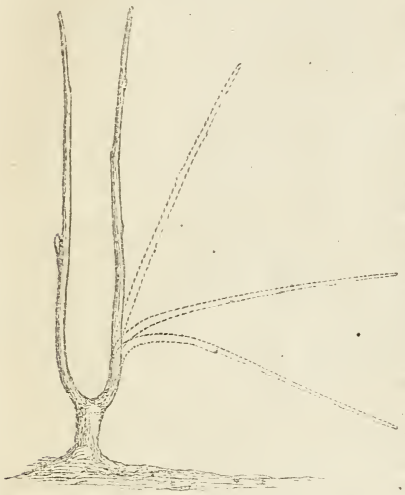
## SCIENTIFIC NOTES.

INCREASING THE VIGOR OF GROWTH IN PLANTS.—A very important announcement has lately been made in France as to the effect produced upon the luxuriance of vegetation by the disturbance of the natural position of the branches. It has been known for some time that if two branches of a fruit-tree be selected of about the same size, and the same

upward inclination to the horizontal plane, and one of these be bent downward toward this plane, it appears to lose its vigor, while the other gains in a like ratio. It is now announced as the discovery of an ignorant peasant on the Danube, named Hooibreuk, that this law holds good only up to the horizontal position; and that if the branch is depressed still further, and below the horizontal, it becomes characterized by much greater vigor than before, and, in fact, will put out leaves and branches to an astonishing and unheard-of degree. But this depends upon keeping the branches as nearly as possible in a straight line, the effect being measurably lost with a considerable curvature. In this case, only the buds which occupy the top of the arc are developed completely, at the expense of the rest, which remain in their original condition, contributing neither to the extension of foliage nor of fruit. (The successive positions of the branch are illustrated in the accompanying cut, Fig. 6.)

Fig. 6.



Duchesne-Toureace, in communicating these facts to *Les Mondes*, attempts to show the causes which seem to determine so great a flow of sap to the branches inclined below the horizontal line, and thinks that the explanation is to be found in the establishment of a siphon arrangement, by means of which the juice is carried over the bend from the main stem in excessive flow. Be this as it may, the fact remains, as illustrated by an experiment prosecuted by this gentleman. In early spring, when the sap was running in the vines, he took four plants of about the same size, and trimmed them so as to leave one stem to each, these being arranged vertically, obliquely upward; horizontally and obliquely downward. He then cut off the stems, and collected and measured what exuded, and found the amount from the branch inclined downward was more than three times greater than that from the others.

MURRAIN IN CATTLE.—The subject of murrain in cattle has of late years received a good deal of attention, and little by little we are acquiring more definite ideas in regard to this disease, as well as to its influence upon the healthfulness of the milk and flesh of the animal. The experiments of Chauveau have shown that tuberculosis of cattle is transmissible; that is to say, by bringing sound cattle in communication with those that are diseased, similar tubercles become developed in the former, or, in other words, they become afflicted with murrain, which is only another name for tuberculosis.

The investigations of Professor Klebs, in Berne, have shown still further that the transmissibility of the disease is not limited to cattle, but may also extend to other animals; indeed he has been convinced that the human tubercles are equally transmissible with those of cattle, and that murrain in cattle owes its origin to the same infectious material as the human tuberculosis. Thus, certain Guinea pigs having been fed with the murrainous matter, were infected with it, and others, treated with the tuberculous matter from man, exhibited the same result.

Again, murrain has been produced in cattle from feeding or inoculating with the human tuberculous matter, and hence it follows that the tuberculosis is transferable from cattle to man, and it appears highly important that murrainous animals should be carefully watched, and that inspection of their meat should be very strictly attended to.

Professor Gerlach, of Hanover, has lately prosecuted additional experiments upon murrain, and has established not only its transmissibility by inoculation, but also has shown, by numerous experiments, that tuberculosis can be transferred by feeding with the milk of murrainous cattle. As conclusions from the facts ascertained by him, Professor Gerlach remarks that, up to this time, murrain has been looked upon, in a sanitary aspect, as an innocent disease, but that it must hereafter be considered as quite the contrary. In former times, or toward the end of the last century, the murrain of cattle was considered as a kind of venereal disease, and while this view lasted great caution was observed in regard to the flesh and the milk. Since it has been ascertained, however, that this is not a syphilitic condition, the meat has been considered as wholesome. This is now known to be an entirely erroneous assumption, and the greatest possible care should be taken to avoid using the meat or the milk in any way.

Influence of food upon poultry and eggs.—The influence of the food of poultry upon the quality and flavor of their flesh and eggs has not generally been taken into consideration; but it is now well ascertained that great care should be exercised in regard to this matter. In some instances it has been attempted to feed poultry on a large scale in France on horse-flesh, and, although they devour this substance very greedily, it has been found to give them a very unpleasant savor. The best fattening material for chickens is said to be Indian corn-meal and milk; and certain large poultry establishments in France use this entirely, to the advantage both of the flesh and of the eggs.

Source of nitrogen in plants.—It is well known that the quantity of nitrogen contained in the crops exceeds in enormous proportion that existing in the manures, the excess undoubtedly being derived from the air. It is now a question whether this is extracted directly from the air by plants, which would thus have the power of assimilating directly, or if it is first taken from the air by the soil, so as to combine with organic matter, and form an assimilable compound. According to Deherain, oxygen, in the presence of organic matter, combines directly with nitrogen to form a compound analogous to the humus of the earth, or to ulmic acid. To illustrate this he placed in a tube oxygen, nitrogen, glucose, and ammonia. On drying the tube and heating it, a black nitrogenized matter was left, and a portion of the nitrogen in the tube was found to have disappeared.

Preferences of climbing plants.—According to Mr. Henry, certain climbers evince a partiality for some particular species of plants, stretching out their tendrils and branches so as to come in contact with them, while to other species they have as decided an aversion, avoiding them, and never becoming attached to them, though they run up the surface of the wall side by side.

Powdered coal for unhealthy plants.—In a communication, addressed to the *Revue Horticole*, the writer states that he purchased a very fine rose-bush, full of buds, and, after anxiously awaiting their maturing, was greatly disappointed, when this took place, to find the flowers small, insignificant in appearance, and of a dull, faded color.

Incited by the suggestion of a friend, he then tried the experiment of filling in the top of the pot around the bush, to the depth of half an inch, with finely pulverized stone-coal. In the course of a few days he was astonished at seeing the roses assume a beautiful red hue, as brilliant and lively as he could desire.

He tried the same experiment upon a pot of petunias, and soon after all the pale and indefinite colored ones became of a bright red or lilac, and the white petunias were variegated with beautiful red stripes. Some of the lilac petunias became a fine dark blue. Other flowers experienced similar alterations; those of a yellow color alone remained insensible to the influence of the coal.

Regulating the hatching of silk-worm eggs.—Duclaux, after a careful observation of the external conditions which favor and influence the hatching of the eggs of silk-worms, has prepared the following rules, by attention to which it is said that the development of the eggs can be regulated at will. First, to prevent an egg from being hatched at the usual time, it must be kept, from the period of being laid, at a temperature between 59° and 68° F., and then exposed fourteen days to cold, three months before the time at which the hatching is desired, being subsequently treated in the usual manner. To cause an egg to hatch before the usual time, it must be exposed to cold twenty days after being laid, and kept in that condition for two months, and then removed. Six weeks later it will be in the same condition as ordinary eggs, and can be treated in the same manner. In this way it is possible to have silk-worms ready for hatching at any season of the year.

Milk-sugar for vegetable juices.—According to Dr. Bouchardat, a specimen of sugar obtained from the *Achra sapota* of the West Indies, on being treated with boiling alcohol at 90 per cent., was found to leave a residuum, which, on further investigation, proved to consist almost entirely of milk-sugar, this substance forming 45 per cent. of the original mass.

Relation of the nitrogen of the atmosphere to vegetation.—Deherain has been conducting certain experiments upon the influence of the nitrogen of the atmosphere on vegetation, and arrives at these conclusions: First, that in the course of the slow combustion of organic matter, the nitrogen of the atmosphere enters into combination, probably to form nitric acid, which, in contact with an excess of carbonized matter, is reduced and then gives up nitrogen to the organic matter; second, that every plant which throws off refuse matter upon the soil which sustains it, furnishes the occasion of a greater or less fixation of nitrogen. This reaction, continued for many years, ultimately produces the accumulation, in soils left to themselves, of a quantity of nitrogen sufficient to maintain a large crop of cereals; third, it is not only by the slight percentage of nitrogen which it contains that dung exercises an action upon vegetation, but, in addition, by the carbon matter in decomposition, which constitutes its entire mass. Buried under the soil, and exposed by the process of cultivation to the influence of the air, this organic matter becomes burned, giving rise to notable quantities of carbonic acid, and its combustion determines the union of elements of the air, with the nitrogen of the dung, and with the nitrogen which, previously floating in the atmosphere, is henceforth drawn into the series of metamorphoses which lead from the soil to the plant and from the plant to the animal.

Preparation of beet leaves for fodder.—Méhay maintains the

entire success of his method of so preparing the leaves of the beet as to render them capable of preservation for several months as fodder; and at the same time greatly improving their qualities as food for cattle. The method consists simply in placing them in baskets, and immersing them in a tank containing diluted hydrochloric acid of 4 degrees of Beaumé. The result of this is to greatly condense the volume of the leaves, and to render it necessary to add more fresh ones to fill up the basket, which has to be again immersed, and finally allowed to drain off. The leaves may then be placed in beds, in dry earth, and kept until needed for use. According to a report of a committee who examned the results of this process, domestic animals become extremely fond of the leaves thus prepared; and, indeed, milch cows fed with them are said to give a large increase of milk, with a decided improvement in the quality of the butter. The tendency to diarrhea in cattle produced by the fresh beet leaves seems not to be developed by this prepared fodder, and for this and many other reasons it is strongly recommended to agriculturists.

Milk of diseased cattle.—Mr. Husson, in a paper upon the milk of animals diseased with the cattle plague, announces, as the result of one of his researches, that neither the flesh nor the milk of animals suffering from this cattle plague—contagious typhus—will convey the disease, although they may suffer greatly in their nutritive properties. The milk of diseased cows he found to have a more or less marked reddish-yellow tinge, and a disagreeable flavor, although cats fed upon it seemed to suffer no inconvenience.

As general conclusions, Mr. Husson remarks: First, that when the typhus breaks out in a cow-house, all the beasts therein are subjected, although in different degrees, to the epidemic influence. In fact, in one instance, the whole herd died, with the exception of four cows, which never seemed to be ill, although they furnished one of the three specimens of milk analyzed. Second, milk cannot, any more than flesh, transmit the disease to man, nor to animals that do not belong to the ruminant family. Third, notwithstanding this, even during the first stage of the disease, when the yield still continues normal, the milk should not be employed as food for young children, in consequence of the modification that has taken place in its principles. Fourth, from the commencement of the disease, the combustible elements of the milk, in great part, disappear, while the azotised elements, on the contrary, are increased in considerable proportions, and are soon found commingled with sanguinolent matters. Frequently there may be observed, under the microscope, agglutinated globules, either mucous or purulent.

New variety of cucumber.—In "Land and Water" we have a figure and description of what is called the new white-spine cucumber. This, when raised on a trellis, grows to an enormous size, one vine having three specimens, each of them three feet in length, besides many others over two feet long. The flesh is said to be very solid, with but few seeds, and the flavor very fine. This method of growing cucumbers is recommended as furnishing a much superior result to that of allowing them to trail on the ground, as they thus grow finer, straighter, and with a larger yield. This new cucumber has the skin perfectly smooth. It is very short in the neck, and it is considered a decided gain to the resources of the vegetable gardener.

Origin of breeds of British cattle.—In a communication to the Literary and Philosophical Society of Manchester, by Mr. William Boyd Dawkins, on the "Origin of our domestic breeds of cattle," he re-

marks that at the present time there are three well-marked forms inhabiting Great Britain. These consist of the hornless cattle, which have lost the horns which their ancestors possessed through the selection of the breeder. The polled Galloway cattle, for instance, are the result of the care taken by the grandfather of the present Earl of Selkirk, in only breeding from bulls with the shortest horns. The hornless is altogether an artificial form, and may be developed in any breed. Second, the *Bos longifrons*, or the small black or brown Welsh and Scotch cattle, which are remarkable for their short horns and the delicacy of their build. Third, the red and white variegated cattle descended from the *urus*, and which have, on the whole, far larger horns. The large domestic cattle of the *urus* type are represented in their ancient purity by the Chillingham wild oxen, (as generally called,) which were probably introduced by the English invaders of Roman Britain, being unknown to that country during the Roman occupation. The *Bos longifrons*, (long-horns,) on the other hand, were the sole oxen which were domesticated in Great Britain during the Roman occupation, and, in remote times, were kept in herds by the users of bronze, and before that by the users of polished stone. The present distribution of the two breeds agrees almost exactly with the areas occupied by the Celtic population and the German or Teutonic invaders. Both the *Bos longifrons* and the *urus* were probably derived from some country to the south and east of Europe, and were introduced by the herdsmen and farmers of the polished-stone period, at a very remote antiquity.

Brandy from sawdust.—The fact has long since been known that if cellulose is boiled with dilute acids grape-sugar is produced, and a similar treatment of lichens, according to a process devised by Professor Stenberg, is the initial step to the preparation of a very fair brandy. We now learn that quite a good brandy can be made from sawdust, generally from a mixture of the sawdust of pine and of fir timber. For this purpose 9 parts of very moist sawdust, .7 of a part of hydrochloric acid, and 33.7 parts of water, making 43.4 parts in all, are to be boiled together, under steam pressure, for eight hours and a half, after which the mass is found to contain 3.33 parts of grape-sugar; and after eleven hours 4.38 parts, in all over 19 per cent. of the entire mass. The acid is now to be neutralized with lime, so that the mash, cooled and ready for fermentation, is to contain one-half a degree of acid, (according to the acetometer,) and a suitable amount of yeast is to be added. After ninety-six hours of fermentation the mash is distilled, and sixty-one quarts of brandy of 50 per cent. of strength will be obtained, perfectly free from any smell of turpentine, and of extreme excellence of flavor. The experiment has not been conducted in a practical way on a sufficiently large scale to determine positively the merits of this process, but it is not at all unlikely that the success may equal that with the lichens, and that a large industry in this direction may be developed. It is not improbable, too, that experiments will show that other kinds of wood than those mentioned may be found better adapted to the purpose in question.

Influence of heat on plants.—Hugo de Vries, in a paper upon the influence of heat upon plants, discusses, in the first place, the upward limit of temperature for vegetable life, and finds occasion to agree with Sachs, who gives this limit at 120° to 130°, Fahr., for the air, and 112° to 117° for the water, although some latitude must be allowed for the age and precise character of the plant. In cases of thermal springs which contain living algæ, this limit must, of course, be largely extended,

as the result of special adaptation. In reference to the effect of rapid changes of temperature, the author finds that such alternations, however great and rapid they may be, do not exercise any injurious effect upon the vitality of plants as long as they remain below the maximum allowable and above the freezing point; but that such changes do exercise a direct effect upon the movement of the protoplasm, by causing its cessation, even in cases where the heating or cooling slowly, to the same degree, would not produce a similar effect. Inquiries into the influence of temperature upon the rapidity of germination confirm the results already obtained by Mr. Sachs—that for each species there is a most favorable degree of temperature for growth, since growth takes place at that point more rapidly than at any other temperature; and that below this point the length of a growing radicle increases in proportion as the temperature is elevated, while above that it is diminished more and more as the temperature ascends.

INOCULATION FOR RINDERPEST.—In an article upon inoculation for rinderpest, detailing the result of several experiments instituted in Russia on this subject, the following conclusions are arrived at: 1. Rinderpest must be considered as a typhus of a peculiar character, which, while having some resemblance to the epidemical typhus in man, differs from it in its permanent course, and the persistent occurrence of a catarrhal condition in general, and a mucous coating of the intestines in particular. 2. The rinderpest is disseminated principally from the steppes of Asia and other provinces of Russia. The region, however, where it first arose and the causes of its origin are unknown. 3. The contagion of rinderpest is transmitted, in part, by direct contact with diseased animals, and partly by the emanations from living and dead animals, affected, although not to any great distance at any one time. 4. In the south of Russia rinderpest is, comparatively, less contagious and dangerous than in other portions of the empire. 5. In summer and winter the rinderpest is generally less violent than in spring and autumn. Autumn is the most unfavorable time for inoculation of rinderpest, the most favorable time being that in which a moderate temperature predominates. 6. All races of cattle are not equally sensitive to contagion of rinderpest. Those less liable are the Kirgus and Kalmuck races, belonging to the steppes. 7. The alleged mitigation and weakening of the virus by repeated inoculation, and in the succeeding generations, does not prove to be substantially true, according to the experiments of Robichew, as even in the fifteenth generation it did not seem to have lost its activity. Professor Jessen considers, however, that the question of the weakening of the virus cannot be regarded as closed until a special series of experiments has been instituted, in which the contagion has been inoculated from the first generation, on gradually, to complete inactivity. 8. It has not been determined, positively, by the experiments how long the pest contagion maintains its aggressive activity. In many cases the virus loses its infecting power after the course of a few days; in others it remains many months. It must, nevertheless, not be overlooked that the aggressive power of the contagion may be dependent upon its preservation or other influences. Single cases of inactivity of the virus may be explained under the supposition that this has lost its activity in consequence of the milder nature of the epizootic, or the animals inoculated with the virus did not become ill, or only in a slight degree, on account of their want of sensitiveness to the contagion, or because they had already experienced the natural disease. In regard to the action of fresh and old virus, experiments have shown that the former generally produces more, and the

latter less violent sickness, and, in many cases, the latter is even inactive. 10. Animals which become violently ill under inoculation, and show the characteristic indications of rinderpest, are not sensitive to further infection. Such animals, however, as are but slightly ill after infection are not always spared when exposed to a repeated attack. 11. It is impossible to say how many years such animals as have survived the inoculation of rinderpest remain protected against a new infection; possibly during their whole lives. An immunity has been shown for a period of at least six years, this being the extent to which the inquiries of the committee have carried them. 12. The question whether inoculation has any influence upon the course of the rinderpest when the natural disease has attacked the same herd cannot now be definitely answered. 13. Dysentery is no protection against rinderpest, as animals attacked with this disease do not lose their susceptibility to the infection of rinderpest when exposed to its influence. 14. The discharges from the eyes and nose are the most efficient of all means of propagating the disease. The result of the inoculation was the same, whether applied on the neck, the ears, or the tail; whether it was communicated by drawing through a thread saturated with virus, or by inserting a strip of the skin cut from an animal which had died of the disease. The characteristic features of rinderpest present themselves generally between the fourth and eighth day after inoculation; and those animals in which the disease becomes fatal generally died on the sixth day after the outbreak.

Experiments with reference to the power of infection residing in the skin of diseased animals resulted as follows: *a*. Sound cattle can be affected by fresh or by imperfectly dried and cleaned skins of affected ones. *b*. The skins of diseased animals which have been simply cleaned by washing with lye and ashes or lime-water, or which have been dried at a considerable degree of heat or thoroughly dried in the open air, do not communicate the infection. The drying of the skins, however, should be conducted, if in the air, at a distance from stables or meadows, and in winter artificial heat must be employed.

In conclusion, the committee make the following remarks: Although the result of the experiments prosecuted to the present time upon inoculation do not entitle the committee to present inoculation as a preservative against the propagation of the rinderpest, they believe that land proprietors should be authorized to establish inoculating institutions at their own expense, the application to be made with the consent of neighboring owners of the cattle; and that these establishments should be widely removed from the roads upon which cattle are transported, and that they should be presided over by thoroughly educated veterinary surgeons.

VARIATIONS OF FLOWERING SEASONS.—Fritsch has lately published the result of an investigation into the variations of the seasons of flowering of plants in different countries, in the same year, and in different years; and basing his conclusions upon fifty-two plants and twenty-three stations, he remarks that the variations of the seasons of flowering are greater, as this time naturally falls in the earlier part of the year. Thus, of plants flowering in March, the variation will amount to thirty-seven days; while of those flowering in June, it amounts only to twenty-four days. These variations, again, are on an average as great in positive seasons as in negative; that is to say, the acceleration of the flowering season, on an average, of each plant investigated, is as great as the retardation; and it is only necessary to divide the entire varia-

tion by two in order to obtain the deviation, whether positive or negative.

USE OF SEWER-WATER AS A MANURE.—According to the *Revue Horticole*, experiments with the sewer-water of Paris, in the cultivation of certain lands below the level of the city, commenced three years ago, have been of the most satisfactory character, and the eagerness that the farmers now exhibit to obtain permission to use these waters on their lands, wherever it is practicable, is justified by the great increase in their value, many of them having previously been of little worth. Thus certain lands now rent for six and seven times as much per annum as formerly.

PREVENTION AND CURE OF TYPHUS IN CATTLE.—Dr. Déclat has published a report of certain experiments instituted by him for the prevention and cure of typhus in horned cattle, taking the occasion of a severe outbreak of the disease in France, in the early part of February, 1871. In the first stable he visited he found eight animals, of which number, one was dying with the fever; a second was badly attacked; and a third had fallen and could not get up; all the others being more or less under the influence of the disease. They had all been officially condemned to destruction as incurable. He first proceeded to administer a draught, consisting of eighty grains of carbolic acid in five to six quarts of water, to which was added a hypodermic injection of one hundred and twenty-five grains of carbolic acid, with the addition of a new substance, the precise nature of which he does not disclose at present. Two other animals were treated by a veterinary surgeon who was in attendance upon the herd. Out of these seven animals three died and four were cured, while of another series similarly affected six were cured out of ten; and, in the opinion of Dr. Déclat, none of them could have survived without this treatment.

A similar treatment of animals not actually under the influence of the disease was followed with the happiest results. Of twenty-five, to which the above-mentioned application was made, not one contracted the disease; the doctor, therefore, thinks himself entitled to urge the prophylactic treatment as of the utmost importance in similar cases. As the result of his researches in this direction, he contends that, by means of his method generally applied, typhus may always be prevented; can almost always be cured while in a state of incubation; is very often cured in its first period, and is sometimes cured at a more advanced stage.

KEEPING GRAIN IN VACUO.—Some time ago Dr. Louvel suggested the idea of keeping grain in a partial vacuum, by introducing it into air-tight vessels and exhausting the air, this being intended to prevent injury from dampness, and to secure it from the attacks of insects as well as vermin. We now learn that this idea has been brought to a practical test, and that it bids fair to enter largely into the operations of grain-dealers. For the purpose in question, vessels are made of boiler-iron, to contain about twenty-seven bushels; and after the grain is introduced and the cover applied, a vacuum is effected, which, for this purpose, need not involve a reduction of pressure of over one-sixth to one-seventh of the ordinary atmosphere. Any number of these receptacles can, of course, be made, and can be used over and over again indefinitely.

# FACTS FROM VARIOUS SOURCES.

CINCHONA.—Since the publication of our February number, containing an article on this subject, (pp. 73, 74,) the Department has received several letters from California in relation to the same subject.

The first is from Arthur B. Stout, M. D., of San Francisco, with a copy of a proposed act "to create and establish a State botanical and zoölogical farm for the experimental culture of all desirable plants of foreign or indigenous growth, available for economic purposes,' for the cultivation of knowledge in zoölogy, and for the foundation of a public thermal sanitarium for the cure of chronic maladies." The plan suggested, and to be carried out by legislation, is to appropriate one million acres of public lands, (granted by the State or by Congress,) forty thousand acres to be divided into four nearly equal and appropriately located farms, so as to obtain all the benefits of different climates, soils, altitudes, and of thermal springs—all to be under one general government, and each to be managed with reference to the object of its institution.

As the California legislature meets only biennially, the corporators desire, to avoid delay, that permission to occupy at least a portion of the lands be obtained from Congress, so that cinchona plants may be procured and set out immediately.

F. A. C. Grebner, of San Francisco, writes that he assisted at introducing cinchona plants into Java, under Dr. Jünghühn, and in their cultivation under the present Superintendent Van Gookum. He also planted over 200,000 cinchona trees in his own coffee plantation, and when they were six years old their bark was sold in Frankfort, Germany, at the price of bark from Peru. Though acquainted with the British plantations at Ceylon and Nighlberry, he confines his remarks to those of Holland, in Java, as the bark is superior to that of British India, and fully equal to that of Peru as regards the quality of the quinine extracted, though the alkaloid is generally less than in the Peruvian.

He says that the shipments of bark from Peru and Bolivia are annually decreasing. The plantations in Java now contain over four millions of trees of the best kind, and in the course of the next year a factory will be erected there to extract the quinine and prepare it for use.

Mr. G. thinks the climate of Southern California well adapted to the raising of cinchona and coffee, and that Chinese labor there will not be dearer, considering its greater efficiency, than Malay labor in Java. He says that entire freedom from frost can only be secured south of Los Angelos, along the coast of San Diego, extending back into the country some thirty or forty miles; that in this district the average temperature for years has been about 62°; the lowest, 51°, in January; the highest, 73°, in August; the rain-fall is 10 inches annually, but there are frequent heavy fogs. Wood-land is scarce, but that is no objection.

Mr. Grebner believes that capitalists cannot be interested in the subject until one or two successful experiments have been made, and proposes to commence on a small scale, at the same time trying coffee planting, and increase the planting as results may warrant. That success may be attained in growing the cinchona, there is little doubt; but as the coffee-plant requires a temperature uniformly above 55°, there is less prospect of success in its culture.

NATIONAL AGRICULTURAL ASSOCIATION.—The next meeting of the National Agricultural Association will be held in St. Louis, Missouri, on

the fourth Monday in May, proximo. In a circular issued by the President, F. Julius Le Moyne, esq., the importance of the meeting is set forth, and every agricultural organization throughout the country urged to send representatives.

ANGORA GOAT-BREEDERS' CONVENTION.—The goat-breeders of California met in convention, in the city of Sacramento, on the 28th day of February last. A permanent organization was effected, and rules and regulations for the government of the association adopted. The following-named gentlemen were elected officers for the current year: Thomas Butterfield, president; Nathan Gilmore, secretary; and L. A. Upson, treasurer.

A committee, previously appointed, made a report on the condition, &c., of the Angora, or Cashmere, goat on the Pacific coast, from which we make the following condensed statement:

First. The experiment of importing and acclimating them has been crowned with success. They have proved both healthy and prolific. The offspring of the pure blood goats are improving in size, and bear heavier fleeces than the imported, fully retaining their rich, silky, and glossy character. The fleece will range in weight from three to three and one-half pounds each from one-third to pure-blood, where they are in large bands; where they range in small bands, and are properly sheltered and cared for, they will average four to five pounds each. The number of pure-blood imported goats, including their offspring, will approximate two hundred and forty, about one hundred of which are owned by one party in Monterey County, about fifty in the hands of another party in El Dorado County, while the remainder are scattered throughout the coast.

Second. The crossing of the Angora with the native goat (breeding the Angora buck to the common female goat) has also proved successful. The progeny is healthy and increased in size over both native and pure-blood stock. The fourth cross produces as heavy a fleece, and of as good quality, as the imported, while the flesh of the grades makes excellent mutton, which commands a ready sale. They are found to be far more healthy than sheep, being free from scab and other cutaneous diseases, and with none of the rank, musky smell so offensive in the common goat.

Third. It is found that the arid plains, bushy foot-hills, and rough mountains of the Pacific coast are well adapted to their growth, as they are now flourishing from Oregon on the north to San Diego on the south. The total number of these goats on the Pacific coast is estimated at forty thousand.

Fourth. A large majority of those who first engaged in raising Angora goats were induced, from various reasons, but principally from the scarcity of pure-blood and high-grade animals, to use very low-grade bucks, a great proportion of them being less than seven-eighths. No fleece has resulted from such crossing; neither is it possible to attain that end so long as such bucks are used. This much, however, has been attained: A large number of grades have been, by this system of breeding, worked up to a point that by now crossing with the pure-blood bucks a flock of valuable wool-bearing goats will be the immediate result. In crossing, the fleece all comes from the buck, consequently the blood of the buck should be pure.

Fifth. There is no market or machinery for the manufacture of the fleece in California, and the principal market is found in Philadelphia. Here the fleece brings 40 cents per pound for the lowest grades, run-

ning up to 80 cents, $1.10, and $1.20 in gold, as per quality. There is a considerable quantity of wool (mohair) in the hands of breeders, yet it is not in sufficient quantities to induce the parties holding it to take the trouble to ship it to the East.

Sixth. The skins of low-grade wethers, disposed of for mutton, are now dressed—the inferior ones into leather for the manufacture of boots, shoes, and gloves, while the better ones have been dressed with the fleece on, and used extensively and profitably in the manufacture of robes, ladies' furs, &c.

AGRICULTURAL ASSOCIATIONS.—Mr. F. H. Gordon, president of the Smith County (Tennessee) Agricultural Club, in the course of a recent letter, makes the following observations touching the great importance of agricultural associations:

Our club unanimously approves the efforts of your Department to enlighten our farmers. And here permit me to say that if the Department of Agriculture can induce farmers everywhere to form small clubs of eight or ten members, and bind them permanently together by motives of self and social interest, so as to induce them to attend all their meetings regularly, and to devote much time to the study of agriculture at home, then our whole industrial population will educate themselves in their professions, and make rapid improvement in the means of living and the prosperity of the country. There can be no general education which is not self-education. A State cannot educate the people. They can and must educate themselves. The State can stimulate, foster, and facilitate self-education. To do this, the Government must reach every citizen at home, individually. If your Department can induce the farmers to form small neighborhood clubs everywhere, then you can reach every one through his club. What our National Legislature and your Department ought to do, in order to accomplish this desired object, must be left to the best minds of the nation. It is evident that farmers will not readily and generally send their sons to our agricultural colleges until they themselves have been partly educated. They must first appreciate the value of science before they will send their sons to college. Hence, the work of reform must commence on the farm and at the fireside. But to accomplish this object your Department must organize small neighborhood clubs everywhere, and send them the science of water, air, soil, and the animal and vegetable kingdoms. These documents will be their text-books at home. Thus the National Legislature will enable your Department to educate all farmers at the fireside and on the farm; and thus the United States present to the world the first educated community. But you cannot get the people generally to form small clubs, unless you offer them some strong inducements. You must teach them that the Government will furnish them with books, documents, and other favors, only upon the condition that they shall use them. They should be required to form clubs before receiving any favors; and more; so long as such favors are continued they should report annually to your Department.

NECESSITIES OF SOUTHERN AGRICULTURE.—Mr. Harvey Hammond, of Augusta, South Carolina, under date March 2, 1872, writes as follows:

I return to you the acknowledgments and thanks of the Beech Island Farmers' Club for the seeds sent by the Department of Agriculture. They have reached us safely, and have been distributed. I trust in due time to report a good result from their trial. The members of the club would likewise signify to you their appreciation of your expressions of interest in southern agriculture. We feel more and more the need of information as the problems set before us by the emancipation of our laborers continue daily to widen. Trained to work, laborers employed by us for their own and their children's children's lifetime, we find ourselves constantly out of our depth as we try to fathom the many and profound changes required by a system that employs laborers by the day and by the job. For instance, we cannot understand how it is that, with a soil and climate producing crops that give a much larger money yield per acre than in the Northern and Western States, we are not able to pay one-fourth the wages to labor that are paid there. It may be that a laborer does more there than he does here, and we therefore feel a great interest in knowing the cost of the various sorts of farm work by the *piece* in the different sections, *e. g.*, daily wages being $1, what does it cost to break up, broadcast, an acre of ground, to plant an acre of wheat, to build 100 feet of fence, to lay off an acre of corn, to cut an acre of grass, &c., &c.

In meteorology, too, we would be benefited by some more general statements. As, for instance, a record for successive years of the last frost in spring, and the first frost in autumn; the *sums* of the temperature, of the rain-fall, &c., for each season, and dur-

ing the period of growth of our leading crops. The farmer has not the time or the capacity for making these generalizations, either from his own observations, (usually worthless,) from those of the Department of Agriculture, or of the signal service. At present the distinctive features of succeeding crop seasons pass by, and leave no record for our guidance.

As for seeds, we feel especially the need of grasses and other forage crops for winter and spring grazing and feeding. We also believe that our cotton-seeds might be greatly improved by a system of budding and hybridizing the varieties of this plant, where it could be scientifically conducted for a length of time, as it might be under glass; and we believe that the southern cotton-planter must rely more and more on the excellence of the staple he produces to overcome competition from other countries.

NORTHERN MAINE.—Mr. J. W. Lang, secretary of the Brooks Farmers' Club, says that Aroostook County contains much first-class farming land, and will receive a large immigration this spring. A colony has been planted there, of Swedes, by State authority and expense. State lands are actually given away to settlers, 50 cents per acre, paid in work upon roads to convenience the settler; and farms, with some improvements, can be procured cheap. Wheat, corn, oats, rye, potatoes, hay, and other products are largely produced. Stock-raising is a leading feature. Orcharding yet in embryo. Schools, mills, and social privileges abound.

The act to promote immigration and the settlement of the wilderness portion of this State, passed by the present legislature, probably provides for all the expenditures of money that will be necessary for the State to make in this direction. The Swedes are proving themselves industrious, economical, and enterprising. That they have a true conception of what is needed to develop the resources of their chosen homes is shown by the fact that they are to erect a steam-mill for the manufacture of lumber.

FARM PRODUCTS IN NEW YORK.—At a late meeting of the Le Roy Agricultural and Horticultural Society, Mr. H. Ives reported a successful potato culture upon 24 acres of average soil, clover turf of a year's standing, turned under and thoroughly tilled with the shovel-plow and cultivator. This thorough tillage prevents rot in the seed, and is cheaper than hand-culture. Such weeds as escape it are carefully exterminated by hand. The whole expense of production, including interest, was $972; the yield was 3,600 bushels, which, at 40 cents per bushel, $1,440; leaving a net profit of $468, or nearly $20 per acre—over 48 per cent. upon the cost. The most productive varieties of seed were the Harrison and Peerless.

The president, Mr. H. H. Olmsted, realized a profit of 30 per cent. upon a moderate yield, raising 2,400 bushels of Early Rose upon 10 acres; and 820 bushels of Harrisons upon 2½ acres. Mr. E. Hammond, of Bethany, found the Early Rose to blight extensively in the top in the second year. Mr. W. L. Bishop raised 200 bushels per acre, but lost about half by blight. Mr. J. Peck, of Stafford, found the Peach Blows better than the Early Rose.

Mr. C. K. Ward raised 8 acres of Diehl wheat, 44 bushels per acre. It was well manured with ten or twelve loads per acre. White Michigan on the same field yielded only 33 bushels per acre.

Mr. J. Peck, of Stafford, raised the pure Diehl wheat after barley, putting twenty loads of manure per acre. Yield, 30 bushels per acre, and quality excellent. Mr. W. L. Bishop raised 50 acres of wheat—25 each of Diehl and White Michigan—raising 1,400 bushels, or 28 bushels per acre, worth, at $1.60, $44.80, leaving a net profit of $26.60 per acre.

Mr. A. Hill, on 1⅝ acres, raised 77 bushels shelled corn; corn, fodder, and pumpkins brought $105.50; expenses, $49.50, leaving a profit of $56. Mr. R. Sweetland raised 150 bushels of Sanford ears per acre, but would not recommend it as a general crop.

Mr. J. E. Hazleton said that there are no orchards in this county too old to be productive. Many trees in New England two hundred years

old were still healthy and productive. The best time for pruning is after the middle of June. Several gentlemen denounced the injudicious pruning practice employed in many cases.

AGRICULTURAL PROGRESS IN DELAWARE.—Mr. William C. Lodge, secretary of the agricultural society at Claymont, Delaware, states the object of that association to be the diffusion of scientific knowledge, based upon actual experiment. The practical aims of the society embrace the most profitable crops that can be grown in the locality, and the securing of maximum results with a minimum outlay of labor and expense. Especial attention is given to the propagation of new and valuable varieties of fruit. Periodical exhibitions are not contemplated, but specimens of merit are presented at the weekly meetings.

PRAIRIE FARMING IN ILLINOIS.—A correspondent from Du Page County, Illinois, a resident since 1842, commenced farming operations in that year by breaking the "raw prairie" from 4 to 6 inches deep with the plow. He found that the more deeply plowed sod rotted much the sooner. Part of the first year's breaking, sown with oats, yielded about 40 bushels per acre. The remainder of the breaking was planted in seed-corn, dropping the seed in every fourth row, lapping the furrow over the corn. This part of the breaking yielded from 25 to 30 bushels per acre. The following year, the sod not yet having sufficiently rotted, the furrows were turned back again, harrowed three or four times, and sown with fall wheat. There being but little snow that winter, the wheat mostly froze out; it was "ball" wheat. Next season another fallow was sown in "blue-stem" wheat, yielding forty bushels per acre. The land was plowed in May, and again just before seeding time, which was during the full moon of September. The seed was sown broadcast on a six-pace land, at the rate of about 2 bushels per acre. The ground was cultivated with a broad shovel-plow, and then the grain was covered by a small triangular drag. In twenty-five years, farming on this system, our correspondent never failed to raise a good crop of fall wheat.

AGRICULTURAL STATISTICS OF BOONE COUNTY, ILLINOIS.—Mr. G. B. Moss, of Belvidere, Illinois, has compiled for the Department the following statistics for Boone County for twelve years, ending with 1871, giving an illustration of the local changes and increase of productions throughout the Western States.

| Year. | HORSES. | HOGS. | SHEEP. | CATTLE. | MULES. | NUMBER ACRES IN CULTIVATION. | | |
|---|---|---|---|---|---|---|---|---|
| | Number. | Number. | Number. | Number. | Number. | Wheat. | Corn. | Other field crops. |
| 1871 | 6,010 | 10,004 | 14,487 | 15,231 | 96 | 15,654 | 22,950 | 25,847 |
| 1870 | 6,438 | 6,754 | 10,531 | 14,718 | 106 | 19,472 | 18,542 | 24,003 |
| 1869 | 6,465 | 5,679 | 21,608 | 14,882 | 98 | 21,911 | 17,385 | 21,905 |
| 1868 | 6,093 | 7,791 | 28,101 | 13,791 | 100 | 20,544 | 16,171 | 20,657 |
| 1867 | 5,685 | 8,971 | 25,693 | 11,590 | 85 | 18,334 | 17,716 | 23,323 |
| 1866 | 5,643 | 7,558 | 21,267 | 11,019 | 68 | 16,743 | 17,231 | 25,860 |
| 1865 | 5,531 | 4,884 | 17,703 | 12,065 | 43 | 18,514 | 16,430 | 26,796 |
| 1864 | 5,195 | 5,525 | 18,061 | 14,370 | 50 | 24,817 | 15,330 | 21,737 |
| 1863 | 5,043 | 6,450 | 13,523 | 14,371 | 42 | 31,849 | 15,670 | 18,894 |
| 1862 | 4,847 | 5,767 | 9,475 | 13,533 | 21 | 36,342 | 14,020 | 15,221 |
| 1861 | 4,760 | 3,894 | 5,808 | 12,617 | 15 | 38,199 | 14,363 | 16,196 |
| 1860 | 4,608 | 3,293 | 4,942 | 12,507 | 9 | 78,084 | 17,550 | 21,497 |
| Totals | 66,318 | 76,757 | 202,239 | 160,695 | 713 | 340,373 | 203,358 | 262,065 |
| Means | 5,526 | 6,396 | 16,853 | 13,391 | 59 | 28,364 | 16,946 | 21,838 |

AGRICULTURE IN COLORADO.—Mr. Thompson J. Hough, near Idaho Springs, Clear Creek County, Colorado, at an altitude of 8,400 feet, last season raised successfully the following crops, viz: Beans, (dwarf,) beets, cabbages, (early,) carrots, cresses, lettuce, onions, parsnips, peas, (all sorts,) radishes, turnips, potatoes, barley, oats, timothy. The following crops have been tested, but have entirely failed, viz: Pole-beans, corn, cucumbers, musk-melons, water-melons, squashes, and tomatoes. The blue-bird, this spring, was first seen March 18, nine days earlier than last year. Natural grasses are failing rapidly, from being trampled by stock, while their seed, when sown, grows so slowly as to be of little practical value. A strong-growing perennial grass is the especial want of those regions.

FARMING IN TEXAS.—Dr. D. W. Brodnax, of Cameron, Milam County, Texas, writes:

Mr. John Gratham, of this neighborhood, with the assistance of an infirm boy seventeen years of age, cultivated and raised, in 1868, 22 acres of cotton, from which he gathered 27 bales averaging 514 pounds, equal to 28⅜ bales averaging 500 pounds. On other land, with same labor, he made 1,000 bushels of corn. In 1869, on the same land, he made 20 bales of cotton, averaging 522 pounds per bale, and 800 bushels of corn. In 1870, on the same land and with the same labor, he raised 24 bales, averaging 518 pounds per bale, and 1,200 bushels of corn. His wife and two little daughters assisted in gathering and saving the crops. In addition, he raised potatoes, onions, and all the garden vegetables usually cultivated here, largely in excess of the wants of his family. He also raised a number of hogs, and had a considerable quantity of bacon to sell. He paid $3 per acre for his land. As good land now brings from $3 to $5 per acre.

MONTGOMERY COUNTY TEXAS.—Mr. Charles B. S. Stewart, secretary of the agricultural society of this county, reports that, since the emancipation of the slaves, the practice of saving corn-fodder in that county has been measurably abandoned, with excellent results in the increased weight of the corn and in increased attention to Hungarian grass, oats, millet, &c. It is found that the whole stalk of oats cut "before the milk formation" becomes very nutritious, and is entirely eaten up by cattle. It requires, however, twice as long to cure hay from the oats cut at this stage. The cotton area of this county, in 1872, will be increased 50 per cent. The crop of 1871 was crippled by a drought of five weeks. It was forwarded before the advance of prices, to the great loss of the producers. The merchants are looking sharply after the earliest reports of the crop.

DISPLACEMENT OF NATIVE GRASSES IN TEXAS.—In the prairies of Texas, especially on river and creek bottoms, the native grasses are rapidly disappearing, from the number of stock ranging upon them. But little effort has been made to supply the loss by cultivating other varieties. Cattle now require feeding. California clover grows here very copiously. Blue grass is growing well in Washington County, and Italian rye-grass in Montgomery. Other varieties are well spoken of.

WINTER WEATHER IN SOUTHEASTERN TEXAS.—Mr. J. E. Carlton, corresponding secretary of the Agricultural, Mechanical, and Blood-Stock Association of Jasper, Jasper County, gives the following record of the weather of that locality for each day of January and part of February, 1872: 1st, 2d, 3d, 4th, and 5th, frost; 6th and 7th, rain; 8th, 9th, 10th, freezing; 11th, 12th, 13th, frost; 14th, 15th, 16th, freezing; 17th, 18th, rain; 19th, 20th, freezing; 21st, 22d, snow; 23d, rain; 24th, 25th, rain; 26th, 27th, sleet; 28th, 29th, 30th, 31st, freezing. February 1st, 2d, 3d, 4th, frost; 5th, 6th, 7th, rain; 8th, 9th, 10th, cold wind; 11th, 12th, 13th, cold and blustering; 14th, 15th, 16th, fair. The coldest winter

known by the oldest inhabitant. This disposes of the pretense that shelter is unnecessary in that climate for farm animals.

SAN BERNARDINO.—A correspondent, under date of March 23, sends us some facts relative to the new settlement of "Riverside," San Bernardino County, California. This settlement is located in the upper part of the Santa Anna Valley, near Mount San Bernardino, fifty miles east of Anaheim Landing on the Pacific Ocean, and sixty miles southeast of Los Angeles, at an elevation of about 1,000 feet above the level of the sea. The settlement is about eighteen months old, and already embraces some sixty families of enterprising and industrious people. The lands on which they are located are from 60 to 100 feet above the Santa Anna River, which furnishes water by means of a ditch nine miles in length, for irrigating purposes. This ditch was not completed until July last, and nothing was raised but corn, beans, &c. Yellow flint-corn, planted August 1, and the white bean, planted the 23d day of the same month, ripened. A large area has been sown with wheat and barley. Barley sown early is now heading out, and early wheat is about ready to head. A second crop of corn and vegetables will be raised after the barley and wheat are harvested. Garden vegetables, including corn, beans, and squashes, are now several inches high. Strawberries, unprotected, are now ripening. Field corn is up and looking finely. The land is clay with a mixture of sandy loam; the climate is dry and warm; the air is pure, and is considered very healthy, being regarded as especially beneficial to those afflicted with lung diseases, many of whom made their home there during the past season. The climate and soil both appear favorable to the cultivation of the raisin-grape, orange, lemon, lime, and English walnut. A noticeable thing in the climate is the fact that when the mercury descends to 32° the frost seldom cuts down such tender vegetation as corn, beans, &c., only slightly, if at all, injuring them.

MESQUITE-GUM.—Mr. F. Kalteyer, treasurer of the Agricultural and Industrial Association of Western Texas, says the mesquite-gum of that region is almost identical with gum arabic, having been in use there for medicinal and technical purposes, especially in the preparation of mucilage, gum-drops, jujube-paste, &c. The past year it has become an article of export, some 12,000 pounds having been gathered in Bexar County, and as much more between that and the coast. No gum is gathered west of Bexar, though the drought was favorable to a large crop. This gum is hardly known east of the Brazos. It exudes from the stem and branches of a *Mimosa*, several species of which grow in Texas, New Mexico, and Arizona. One of these species, *Algarobia glandulosa*, (Torrey and Gray, N. A. F., 399,) is rarely met with below the mountain regions of Western Texas. The species most common in Bexar County grows from 20 to 40 feet high and 18 inches thick. From it charcoal is manufactured. It is generally used for picket poles, being very durable. It is also made into handsome furniture, the grain being very fine. It grows where no other fruit-tree would live. It was favorably noticed in the last annual report of the American Pharmaceutical Association.

WIRE-FENCES IN TEXAS.—Mr. R. E. Talbot, Georgetown, Williamson County, Texas, describes a new wire-fence which has been extensively introduced into that section, which, it is claimed, can be built for less than $1.25 per rod. It has been fully tested by wild Texas cattle, and is perfectly hog-proof. It consists of eight wires, No. 9 size, passing through cedar posts a rod apart. The lower four wires are 6 inches apart, and the others 9 inches. This will give a 5-foot fence. Between

the posts weave in three sawed or split pickets, which should not reach the ground. Staple the wires to the pickets.

OTOE COUNTY, NEBRASKA. — A correspondent writes us that the winter-wheat has been badly injured in this county, though the full extent is not known. Osage-orange hedges are thought to be almost entirely destroyed.

FRUIT PROSPECTS IN ILLINOIS.—Mr. J. Cochrane, of Havana, Mason County, Illinois, writes, under date of April 6, that about half the peach buds in that section are killed, those that are yet good being mostly seedlings. The prospect for apples, pears, and cherries could not be better.

WASHINGTON TERRITORY.—Mr. A. H. Miller, a resident for twenty years of Yakima County, Washington Territory, sends us some interesting facts concerning that Territory. He has never seen the snow exceed eight inches in depth, nor remain on the ground over two weeks in each year. The wind rarely blows a gale even in the winter season, and the cutting blasts of the prairie States are never felt. As a general thing stock can be well kept through the winter on uncut grass. Cows, dried in the fall, get into good order for beef by spring, and calves and yearlings steadily gain in size without any other feed than that obtained by grazing. The soil is measurably good—in some places remarkably productive. While one spot may possess a rich, black, loamy soil, the ground a few yards distant will be white with alkali. Corn, wheat, oats, barley, sorghum, broom-corn, millet, herd's-grass, melons, tomatoes, beans, potatoes, &c., yield good crops with fair culture. One farmer raised last year on sod land 40 bushels of sound corn to the acre and 73 bushels of goose-wheat or Russian rye. Another raised 60 bushels of white winter-wheat to the acre. It is no uncommon thing to cut from 80 to 90 bushels of oats to the acre. The cultivation of sorghum promises to be successful, as does that of the larger and smaller fruits.

ODESSA WHEAT.—Mr. L. H. Eaton, of Monroe, Green County, Wisconsin, has cultivated the Odessa wheat for five years, with good results. Twice during this time other varieties failed, but the Odessa produced 20 bushels to the acre. The berry is small, but weighs 63 pounds to the measured bushel. It is equal to winter-wheat for milling purposes. It is eight days later in ripening than other varieties.

WINTER-WHEAT.—Mr. John J. Thompson, of Thompson's ranch, Dakota Territory, writes under date of March 8 that he has 40 acres of growing Baldwin wheat which has stood the winter finely, and is now quite as green as it was the 1st of November last.

EFFECTS OF THE SEVERE WINTER.—Mr. R. E. Baldwin, writes as follows from Ottawa, Franklin County, Kansas, under date of March 30:

> The winter has been one of unparalleled severity. Twenty thousand cattle have perished in the Solomon Valley from starvation and the cold weather. Potatoes buried for spring use and for seed are mostly frozen, the ground freezing sometimes to the depth of three feet. Early-sown winter-wheat is almost an entire failure. That sown late in the fall and not germinating is now coming up, but must inevitably make a very light crop.

TRIAL OF AGRICULTURAL IMPLEMENTS.—The Ohio State board of agriculture have appointed a trial of agricultural implements and machines, to take place at Springfield, June 18, 1872. The following is a list of classes designated for competition, with the premium for the best of each description: Plow for general purposes, stubble-plow, sod-plow,

double plow; premium in each case, a silver medal or $20. Subsoil plow, hill-side plow, one-horse plow, double-shovel plow—a premium for each of a silver medal or $10. Steam-plow, practical utility of operation to be fully demonstrated, $50; improvements in plows, diploma. Two-horse grain-drill, $40 and diploma; one-horse grain-drill, $10 and diploma; garden seed-drill, $5; horse-power corn-planter, $20 and diploma; potato-planter, $5; potato-digger, $10; two-horse corn-cultivator, $20 and diploma; one-horse corn-cultivator, $10 and diploma; farm-road scraper, $10; roller and crusher, $15; harrow, $10; mole or blind ditching-machine, $20; post-hole borer or digger, $5. In giving premiums on plows, the following points will be considered: Gross draught; weight; loss of power in overcoming friction; net power required to cut and turn the furrow-slice; width of furrow-slice; depth of furrow-slice; comparative draught; simplicity of structure; materials; workmanship; durability; price; superiority of work. Competition is invited from all parts of the Union.

PREMIUM CORN CROPS IN VIRGINIA.—The following particulars are from statements on corn by competitors for premiums at the Rockbridge County Fair, Virginia: Farm of J. D. H. Ross, clay loam, upland; an old timothy and white clover sod, plowed in December with three horses, harrowed four times with three horses; hills marked 3 feet by 3½ feet apart, and manured with home-made compost, a handful to three or four hills; plowed three times in the course of the season; one acre yielded 76$\frac{9}{10}$ bushels of shelled corn, 56 pounds to the bushel, and five acres gave 253$\frac{4}{7}$ bushels. Farm of A. L. Nelson, loam, with clay subsoil; in grass for four years; plowed in February to a depth of 12 or 14 inches, and harrowed well just before planting, April 26 and 27; the hills received plaster and ashes at the rate of two-thirds of a bushel of plaster and one and one-third bushels of ashes per acre; one acre yielded by measure 91$\frac{1}{3}$ bushels; by weight, 86 bushels 37 pounds each; five acres yielded 317 bushels by weight. Farm of G. W. Pettigrew, on a sandy loam, having a northeastern exposure, and overlaid by one to three inches of soil deposited by the flood of 1870; plowed in April to the depth of ten inches, planted April 12; one acre yielded 89¼ bushels by measure, or 97 bushels 47 pounds by weight, and five acres gave 400 bushels and 40 pounds by weight.

EXPERIMENTAL FARM FOR MISSISSIPPI.—Governor R. C. Powers, of Mississippi, in a message recently communicated to the legislature of that State, recommends that the grounds lying between the State capitol building and Pearl River be erected into a public park and experimental farm for agriculture, under the auspices of the Planters, Manufacturers, and Mechanics' Association of that State. But a small appropriation is asked, which the governor thinks should be expended under the direction of the State engineer and professor of agriculture of Oxford University.

HEAVY YIELD OF CORN.—J. Sanders, of Saunders County, Nebraska, deposes that he raised 18 acres of corn last year, which averaged 90 bushels to the acre. J. H. Nesbitt, of the same county, also deposes that 75 acres of corn raised by him averaged 97 bushels per acre, while another field of 175 acres averaged 85 bushels per acre.

PROPER MODE OF TESTING SEEDS.—Mr. Elliott H. Benton, of Le Roy, Dodge County, Wisconsin, in a letter commending the policy of this Department as to the distribution of seeds, says:

"To get a practical result in the least time, seed sufficient for at least one-half acre

should be furnished, so that ordinary field-culture in every respect should be observed in testing its value; and this can be done satisfactorily *only* by a perfectly similar treatment of some common sort under perfectly similar conditions, side by side, such as, first, amount of seed per acre; second, quality and situation of land; third, manner and time of sowing; fourth, depth and manner of cultivation; fifth, former treatment of land, &c. The testing of any field-crop requires very faithful management and patient waiting; for not less than three years will be essential to acclimate and give an average of seasons. The most valuable result would be reached by a maximum yield from the use of a minimum amount of fertilizers and labor. There is no practical value attaching to the use of an unlimited amount of manure and labor, simply to get the largest percentage of yield, for the crop may cost more than it is worth. But the first point should be to ascertain the best manner of sowing; secondly, to ascertain the proper amount of seed per acre; thirdly, to ascertain the best method of cultivation for a certain variety of grain and a certain character of soil; and, fourthly, to apply the manure in the manner to get the best effect.

EXPERIMENTS WITH SEEDS.—The committee appointed at the convention held in Chicago, on the 24th and 25th days of August last, to report a plan of experiments to be tried in common at the different agricultural colleges of the country, submit the following:

*Experiment No.* 1, *to test the variation of soils on adjacent plats.*—We recommend that 20 plats of one-twentieth of an acre each, 2 by 4 rods, with strips of 4 feet between each, be selected on a soil as uniform as possible, which has not been manured, at least for a number of years. It should be well drained, (tile-trained is best.) The aspect of the whole should be the same, and the slope, if any, as uniform as possible. Where not uniform the facts should be noted. They should be plowed and otherwise cultivated uniformly at the same time even in the day, and under the same conditions as nearly as possible. These plats should be planted to corn in drills at a uniform distance between rows, one kernel in a place, at uniform distances in the rows, so that each plat shall contain the same number of stalks. Good cultivation should be given, but no manure applied, and the experiment should be repeated in 1873 and 1874. The stalks and ears on each plat should be counted. The corn should be cut up at a proper stage of ripeness, weighed green, each plat separately, and cured in the same stooks; and when thoroughly dried should be weighed again, stalks and all. The ears should then be husked and weighed separately, both when first husked and again when the cobs seem thoroughly dried. The pounds each of soft and sound corn should be noted. The dates and amount of time occupied in going through each process of planting, culture, harvesting, &c., should be accurately noted and performed in the dry part of the same day. This experiment is intended to ascertain the differences in the natural productiveness of adjacent or nearly adjacent plats, with the view of getting the exact conditions before applying manures. The corn used should be the variety most successful in the neighborhood, and the strips between plats should be kept cultivated.

*Experiment No.* 2. *to test the uniform application of manure on alternate plats.*—As an immediate experiment, under somewhat uncertain conditions, we recommend this: The same care in securing uniform soil, aspect, slope, &c., should be had. We recommend, as in the other case, 20 plats, each 2 by 4 rods, but separated each from the other by strips of 4 feet each, in order that the influence of the manure on manured plats may not be felt on unmanured plats. These strips should be kept clean and the surface stirred. The same weight of manure, of uniform quality, should be applied to alternate plats, leaving the other half unmanured. The plats should be planted with corn, and be cultivated and harvested as prescribed in experiment No. 1.

*Experiment No.* 3, *to test the comparative productiveness in hills and drills.*—Two acres, as nearly uniform and identical in soil, aspect, and slope as possible, should be planted, after staking off the ground, as in experiment No. 1, one in hills, the other in drills, the rows being the same distance apart, and the number of stalks to the square rod the same. The different fields should receive the same amount of cultivation, the crops be harvested and weighed, and the sound and soft corn compared as in experiment No. 1.

*Experiment No.* 4, *to test the comparative effect of common and continuous cultivation.*—We recommend that another acre be taken, 10 by 16 rods, and divided into one-twentieth of an acre plots, and planted with corn in drills, as in experiment No. 1, making the rows run the long way of the acre, four rows to the rod, or forty rows, each 10 rods long. Commencing on one side, give the first four rows common culture; the next four continuous stirring of the surface during the whole time of cultivation, and so on, alternating through each acre, giving five strips common and five strips continuous cultivation. In harvesting, we take account only of the two middle rows of each strip or tier of plats. These should be cut up, weighed, dried, husked, &c., as in experiment No. 1.

LUMBER PRODUCT OF THE UPPER MISSISSIPPI.—Local estimates assign the following aggregates to the last "log crop" of the Saint Croix River and its affluents, viz: Willow River, 9,000,000 feet; Apple River, 25,000,000; Wood River, 3,000,000; Clam River, 5,000,000; Yellow River, 9,000,000; Nimekagon River, 25,000,000; Chipenazey River, 7,000,000; Totogatic River, 6,000,000; Frog Creek, 5,000,000; Beau Creek, 2,100,000; Moose River, 4,000,000; Main Saint Croix River, 6,000,000; Snake River, 70,000,000; Kettle River, 30,000,000—total, 206,000,000. The Mississippi and its affluents, above the Falls of Saint Anthony, yielded about 200,000,000 feet, making 412,100,000 feet produced by the Upper Mississippi and its affluents during the winter of 1871–'72.

SWISS SCHOOL OF MILK PRODUCTION AND MANAGEMENT.—The Swiss Mountain Union, which has for many years been interested in the milk business, has issued a circular in which it claims that milk production and the care of the mountain pastures are the inseparable factors of the nation's wealth. The only article of export is cheese, which was exported in 1868 to the value of 18,674,832 francs, and in 1869, 21,453,796 francs. The increase of milk products in other parts of the world is alluded to. American factory cheese, an imitation of the English Cheshire, is rivaling its prototype in its home market. Sweden and Denmark have established extensive dairies, while Holland, which controls the cheese trade of the world, has established at Utrecht a perpetual exhibition of dairy utensils, &c., for the instruction of dairymen. The Austrian minister of agriculture has given two annual prizes for the benefit of cheese-factory associations, while in Vorarlburg, Tyrol, Bavaria, Italy, and Prussia, the latest facts, principles, and improvements are disseminated by means of itinerant lecturers, fairs, exhibitions, and publications. It is proposed in Switzerland to adopt this policy in the organization of a school of theoretical and practical instruction in milk production and management. For this purpose funds are to be raised from the cantons, agricultural societies, and individuals. Great results are anticipated from this enterprise.

COTTON-SEED AS A FERTILIZER.—Mr. G. G. Zenor, a planter near Pattersonville, Louisiana, last year made 65 hogsheads of sugar from 35 acres of old prairie land. From 12 acres, fertilized with cotton-seed at the rate of $15 per acre, he obtained 35 hogsheads, or nearly 3 hogsheads per acre. The remaining 23 acres produced 30 hogsheads, or less than 1¼ hogsheads per acre. This surplus product of 1⅔ hogsheads, about 2,000 pounds per acre, involved an additional cost for fertilizers of about three-quarters of a cent per pound.

CALIFORNIA WOOL PRODUCT.—From Miller & Co.'s annual wool report, dated San Francisco, California, March 11, 1872, we have the following facts relative to the wool product of that State for the year just closed: Spring clip, estimated receipts at San Francisco and other points, 13,389,187 pounds; fall clip, 9,896,941 pounds; pulled wool received, 990,125 pounds, making a total of the product of California for the year 1871 of 24,276,253 pounds. The total product for 1870 was 19,460,565 pounds; increase, 4,815,688. There were also received at San Francisco from Humboldt, Oregon, Washington Territory, and British Columbia, 1,187,160 pounds; from Sandwich Islands and Australia, 1,016,463 pounds, and from Mexico 1,090 pounds. Total amount received from other sources, 2,204,713 pounds.

"LOST NATION WHEAT."—Mr. J. W. Lang, of Brooks, Maine, writes

that this wheat is taking the lead in his State. Notwithstanding the drought and grasshopper plague, seventy-three bushels of handsome wheat were produced last year on three acres of plowed land upon an old farm in Waldo County. On another, where the grasshoppers were in great numbers, reducing the hay crop three-fourths, sixty-four bushels were produced on four acres. No other grain was harvested on the same farm out of several acres sown. This wheat makes a fine grade of flour, and holds its reputation in all parts of the State. Commands $3 per bushel for seed.

ENCOURAGEMENT TO TREE-PLANTING IN MAINE.—The following act was passed by the recent legislature, and has become a law:

That any land-holder in this State who shall plant or set apart any cleared lands, or lands from which the primitive forest shall have been removed, for the growth and production of forest-trees, within ten years after the passage of this act, and shall successfully grow and cultivate the same for three years, the trees being not less in number than two thousand on each acre, and well distributed over the same, then on application of the owner or occupant of such lands to the assessors of the town in which the same is situated, and is so successfully cultivated or set apart to forest-trees, and at the time of such application shall file with said assessors a correct plat of such lands, with description of their location, and setting forth all the facts in relation to the growth and cultivation of said grove of trees, or incipient forest, the same shall be exempt from taxation for twenty years thereafter; provided such grove or plantation of trees shall during that period be kept alive and in a thriving condition.

WHEAT AND POTATOES IN WESTERN NEW YORK.—At a recent meeting of the Le Roy Agricultural Society, Genesee County, New York, C. K. Ward reported a crop of 352 bushels of Diehl wheat, grown on 8 acres, which had been dressed with about eleven loads of manure per acre. This yield, averaging 44 bushels per acre, was the largest he had ever obtained. W. L. Bishop reported 1,400 bushels of Diehl and white Michigan wheat on 50 acres, averaging 28 bushels per acre, worth $1.60 per bushel. Expenses per acre (on summer fallow) $18.20, leaving a profit of $26.60 per acre. H. Ives, of Batavia, reported 3,600 bushels of potatoes, Early Rose, Goodrich, Harrison, and Jackson, on 24 acres, averaging 150 bushels per acre. Total value of the crop, at 40 cents per bushel, $1,440; expenses, including $16 for manure on one acre, taxes, and 7 per cent. on land, valued at $180 per acre, amounted to $972, or $40.50 per acre; total profit, $468; profit per acre, $19.50. Mr. Ives has had long experience in this crop, and this statement represents his average product and profit for a course of years. He plants on a clover sod of one year, and does all the tilling with shovel-plow and cultivator, running them once a week till time of wheat harvest. H. H. Olmsted, president of the society, reported 2,400 bushels of Early Rose potatoes on 10 acres, averaging 240 bushels per acre, and 820 bushels of Harrison on 2½ acres, averaging 328 bushels per acre.

FLAX CULTURE IN IRELAND.—The acreage of flax culture in Ireland, for the year 1871, in the provinces of Ulster, Connaught, Leinster, and Munster, was 156,883 acres. The number of acres devoted to this culture in the same provinces in 1870 was 194,910, showing a decrease of 38,027 acres in the year 1871.

EXPERIMENTAL FARMS.—Mrs. William Daviess, of Harrodsburgh, Kentucky, in a well-written article contributed to the press of that State, urges the establishment of experimental farms in each county, under the direction and control of county agricultural associations.

FULTZ WHEAT IN POTTAWATTAMIE COUNTY, IOWA.—Mr. D. B. Clark writes as follows from Council Bluffs, Iowa, under date of April 8:

September 17, 1871, I sowed four quarts Fultz winter-wheat. All winter-killed ex-

cept a little end of the piece protected by a board fence. October 7, sowed four quarts same variety, which is also all winter-killed. The past winter has been the most severe on winter-wheat we have had for many years. A good rain a few days ago has revived the little wheat still alive. September 8, I sowed one field of Iowa Amber. From present appearances, it will make half or two-thirds of a crop. On the following day I sowed another field of the same variety of wheat, which looks as though it would make three-fourths of a crop.

FULTZ WHEAT IN CALHOUN COUNTY, ALABAMA.—Mr. E. T. Read writes from Jacksonville, Alabama, under date of April 7:

Wheat is more backward in appearance than usual at this season of the year, but we have high hopes of a good crop. The Fultz wheat has stood the cold weather or winter best of any thus far. I think it will be a success here.

EXCELSIOR OATS.—Mr. John De Lyser, of Sheboygan County, Wisconsin, gives the following as the result of his experiments with Excelsior oats:

In the spring of 1869 I received from the Department of Agriculture 10 pounds of Excelsior oats. Owing to the wet season, I only succeeded in raising 1½ bushels, weighing 40 pounds to the bushel. In 1870, I sowed this seed on a half acre of ground, and secured 22 bushels of oats, weighing 42 pounds to the bushel. Last spring I sowed 11 bushels on four and one-half acres, and raised 40 bushels to the acre, (thrasher measure,) weighing 40 pounds to the bushel, being 61⅞ bushels (of 32 pounds to the bushel) per acre.

TAHITI COTTON.—In January, 1871, this Department received through Hon. Geo. M. Robeson, Secretary of the Navy, a specimen of the cotton staple grown in the island of Tahiti. The staple was of such unusual length and fineness that the then Commissioner at once wrote to Hon. Dorance Atwater, our consul at Tahiti, requesting him to procure from two to five bushels of the seed for experimental purposes in the extreme Southern or Gulf States. Secretary Robeson, in his letter transmitting the sample of cotton, informs the Department that the naval officer forwarding it states that in the year 1870 two million pounds of the cotton were sold in France at $1 per pound. About six bushels of this seed were received from Mr. Atwater, a few weeks ago, and five bushels of it were at once forwarded, in packages of one peck each, to leading cotton-growers of the South. The remainder, about one bushel, was forwarded to the Cotton-Growing Association of California.

TOUZELLE WHEAT.—Professor J. W. Mallet, of Albemarle County, Virginia, says of the White Touzelle wheat:

The grain ripened rather earlier than most of the wheat in this region; was full and plump, weighing 62½ pounds to the bushel, and was a good deal admired by many farmers, who considered it likely to prove a useful variety here.

FINE CROP OF SUGAR-CANE.—The Louisiana Sugar Bowl, of April 4, says that the Patout Brothers last year cultivated 106 arpents of plant, and 70 arpents of stubble-cane, with twenty hands, and made 225 hogsheads of sugar, weighing about 300,000 pounds. This is equal to a yield of 1,704½ pounds to the arpent, which, at an average of 7 cents per pound, yielded within a fraction of $119.32 per arpent. The same hands also made enough corn to supply the plantation during this year. Besides their own crop the Patout Brothers ground the small crops of eight or ten of their neighbors, amounting to about 75 hogsheads more, they receiving about one-third of this sugar, which swelled their crop to about 250 hogsheads last year.

WINE PRODUCT OF 1871.—In a paper read before the Mississippi Valley Vine-growers' Association at a recent session, Mr. Bush estimated the production of Missouri at 1,000,000 gallons; Illinois, 1,200,000; New York, 2,250,000; other States east of the Rocky Mountains 1,000,000; California, 7,000,000; total, 12,450,000. Mr. Bush predicts

"that Saint Louis is to become the center of this interest—another Bordeaux for the distribution of wines."

RAIN-FALL IN CALIFORNIA.—The rain-fall of the closing months of 1871 at San Francisco was greater than that of the same portion of any previous year since the settlement of the State. The rain-gauge shows that, prior to January 1, 20.29 inches had fallen. The next largest observed aggregate was in 1851, amounting to 19.31 inches. At Sacramento, up to December 31, the rain-fall was but 12.42 inches; at Stockton 10.80; at Turlock, in Stanislaus County, 8.52; Saint Andreas, up to December 23, 8.52; Shasta, up to December 26, 30.25; Nevada, up to December 30, 36.00; Los Angeles, up to December 30, 8.21.

# MARKET PRICES OF FARM PRODUCTS.

| Articles. | March. | April. |
|---|---|---|
| **NEW YORK.** | | |
| Flour, superfine, State.....per barrel.. | $6 10 to $6 50 | $6 25 to $6 60 |
| extra, State.....do..... | 6 70 to 7 50 | 6 70 to 6 45 |
| superfine western.....do..... | 6 10 to 6 50 | 6 25 to 6 60 |
| extra to choice western.....do..... | 6 70 to 9 50 | 6 65 to 9 50 |
| extra southern.....do..... | 7 00 to 7 75 | 6 90 to 7 10 |
| good to choice.....do..... | 7 80 to 9 50 | 7 15 to 9 50 |
| Wheat, No. 1 spring.....per bushel.. | 1 57 to 1 59 | 1 55 to 1 59 |
| No. 2 spring.....do..... | 1 52 to 1 56 | 1 50 to 1 53 |
| winter, red, western.....do..... | 1 63 to 1 70 | 1 67 to 1 70 |
| amber, western.....do..... | 1 70 to 1 73 | 1 70 to 1 77 |
| white, western.....do..... | 1 72 to 1 80 | 1 73 to 1 80 |
| Rye.....do..... | 92 to 93 | 88 to 88½ |
| Barley.....do..... | 1 12½ to 1 14 | 80 to 83 |
| Oats.....do..... | 52 to 54 | 53½ to 57 |
| Corn, new western, mixed.....do..... | 70 to 70½ | 71 to 71½ |
| old western, mixed.....do..... | ..... | ..... |
| Hay, shipping qualities.....per ton... | 25 00 to ——— | 28 00 to 29 00 |
| prime.....do..... | 27 00 to 32 00 | 28 00 to 34 00 |
| Pork, mess.....per barrel.. | 13 50 to 14 10 | 12 75 to 13 00 |
| prime.....do..... | 12 00 to 13 87 | 10 75 to 12 75 |
| Beef, plain mess.....do..... | 9 00 to 11 00 | 8 00 to 9 50 |
| extra mess.....do..... | 11 00 to 12 50 | 10 00 to 12 00 |
| Lard.....per pound.. | 9¼ to 9¾ | 8½ to 8⅞ |
| Butter, western.....do..... | 12 to 23 | 12 to 23 |
| State dairy.....do..... | 21 to 37 | 24 to 40 |
| Cheese, western dairy.....do..... | 14 to 16 | 14 to 17 |
| State factory.....do..... | 15 to 17½ | 15 to 20 |
| Cotton, ordinary to good ordinary....do..... | 19⅜ to 21⅝ | 20⅜ to 22½ |
| low middling to good middl'g.do..... | 21⅝ to 23⅝ | 22⅝ to 24⅝ |
| Tobacco, lugs, all grades.....do..... | 7½ to 8¼ | 8 to 9¼ |
| common leaf.....do..... | 8¼ to 10 | 9 to 10¾ |
| Wool, pulled.....do..... | 70 to 87½ | 62 to 83 |
| tub-washed.....do..... | 98 to 1 00 | ..... |
| California, spring clip.....do..... | ..... | ..... |
| fall clip.....do..... | 39 to 41 | 43 to ——— |
| Texas, inferior to common.....do..... | ..... | ..... |
| **BOSTON.** | | |
| Flour, western, superfine.....per barrel.. | 6 00 to 6 25 | 6 00 to 6 50 |
| extras.....do..... | 7 00 to 8 25 | 6 75 to 8 00 |
| choice.....do..... | 8 50 to 10 50 | 8 25 to 11 25 |
| southern extras.....do..... | 7 00 to 7 50 | 7 00 to 7 25 |

*Market prices of farm products*—Continued.

| Articles. | March. | April. |
|---|---|---|
| BOSTON—Continued. | | |
| Flour, choice Baltimore ..... per barrel | $9 00 to $10 50 | $9 00 to $11 00 |
| Wheat ..... per bushel | 1 60 to 1 65 | 1 50 to 1 90 |
| Rye ..... do | 90 to 95 | 92 to 95 |
| Barley ..... do | 75 to 1 20 | 75 to 1 20 |
| Corn, southern yellow ..... do | 77 to 78 | 77 to 78 |
| western mixed ..... do | 75 to 77 | 76 to 77 |
| western yellow ..... do | 77 to 78 | 77 to 79 |
| Beef, mess ..... per barrel | 10 00 to 12 00 | 10 00 to 12 00 |
| extra ..... do | 12 00 to 16 00 | 12 00 to 16 00 |
| Pork, prime ..... do | 12 00 to 12 50 | 11 00 to 12 50 |
| mess ..... do | 14 75 to 15 00 | 14 00 to 14 50 |
| Lard ..... per pound | 9¼ to 10 | 9 to 9¾ |
| Butter, New York and Vermont ..... do | 18 to 35 | 18 to 35 |
| Canada, choice ..... do | 27 to 30 | 29 to 32 |
| western ..... do | 17 to 27 | 13 to 28 |
| Cheese, N. Y. and Vt., choice factory .. do | 16½ to 17½ | 19 to 20 |
| Ohio choice factory ..... do | 14 to 16½ | 17 to 19 |
| Hay ..... per ton | 22 00 to 32 00 | 30 to 33 |
| Wool, Ohio and Pennsylvania ..... per pound | 75 to 90 | 75 to 90 |
| Michigan ..... do | 70 to 82 | 75 to 90 |
| other western ..... do | 70 to 80 | 75 to 82 |
| California ..... do | 35 to 55 | 35 to 55 |
| Texas ..... do | 35 to 50 | 35 to 50 |
| combing fleece ..... do | 90 to 92 | 92 to 95 |
| PHILADELPHIA. | | |
| Flour, superfine ..... per barrel | 5 25 to 5 75 | 5 25 to 6 25 |
| extras ..... do | 6 00 to 8 50 | 6 00 to 8 50 |
| family and fancy brands ..... do | 9 00 to 10 00 | 10 00 to 11 00 |
| Wheat, red, Penn. and western .... per bushel | 1 60 to 1 62 | 1 76 to 1 77 |
| amber ..... do | ..... | 1 80 to ——— |
| Rye ..... do | 90 to ——— | 87 to 88 |
| Corn, yellow ..... do | 65½ to 66 | 65 to ——— |
| mixed, western ..... do | 66 to ——— | 64 to 66 |
| Oats, western white ..... do | 55 to 56 | 54 to 55 |
| Pork, mess ..... per barrel | 14 00 to 14 75 | 13 00 to 13 25 |
| Beef, mess, city packed ..... do | 15 00 to 15 50 | 14 50 to 15 00 |
| Lard ..... per pound | 9½ to 9¾ | 8¾ to 9 |
| Cotton, middling ..... do | 23 to 23½ | 23 to 23½ |
| BALTIMORE. | | |
| Flour, superfine ..... per barrel | 6 25 to 6 75 | 6 50 to 7 00 |
| extra ..... do | 7 25 to 8 25 | 7 25 to 8 00 |
| family and fancy ..... do | 8 25 to 11 25 | 8 25 to 11 25 |
| Wheat, Pennsylvania ..... per bushel | 1 66 to 1 72 | 1 81 to ——— |
| western ..... do | ..... | ..... |
| Maryland ..... do | ..... | 1 75 to 2 00 |
| Rye ..... do | 95 to 1 02 | 95 to 1 05 |
| Corn, yellow ..... do | 64 to ——— | 63 to ——— |
| white ..... do | 64 to 66 | 63 to 64 |
| Hay, western ..... per ton | ..... | ..... |
| Pennsylvania and Maryland .... do | ..... | ..... |
| Pork, mess ..... per barrel | 14 00 to 14 25 | 13 25 to 13 50 |
| Butter, western, prime to choice .. per pound | 21 to 27 | ..... |
| New York ..... do | 35 to 38 | ..... |
| Cheese, western factory ..... do | ..... | ..... |
| eastern ..... do | ..... | ..... |
| Lard ..... do | 9 to 9¼ | 8⅞ to 9 |
| Cotton, ordinary ..... do | 20¾ to ——— | 20 to 21½ |

*Market prices of farm products*—Continued.

| Articles. | March. | April. |
|---|---|---|
| BALTIMORE—Continued. | | |
| Cotton, middling.....per pound.. | $0 21⅝ to $0 22½ | $0 22½ to $0 23 |
| Tobacco, common to good lugs.....do..... | ..... | ..... |
| common to medium leaf ....do..... | ..... | ..... |
| Wool, unwashed, free from burs.....do..... | ..... | ..... |
| tub-washed .....do..... | ..... | ..... |
| CINCINNATI. | | |
| Flour, superfine.....per barrel.. | 6 75 to 7 00 | 6 75 to 7 00 |
| extra .....do..... | 7 25 to 7 50 | 7 40 to 7 65 |
| family .....do..... | 7 50 to 7 75 | 7 60 to 7 85 |
| Wheat, No. 1 white.....per bushel.. | 1 68 to 1 70 | 1 80 to 1 82 |
| No. 2 white.....do..... | ..... | ..... |
| No. 1 red .....do..... | 1 63 to 1 65 | 1 70 to 1 71 |
| No. 2 red .....do..... | 1 60 to 1 62 | 1 68 to 1 77 |
| Corn, white .....do..... | 50 to 51 | 46 to 48 |
| yellow .....do..... | ..... | ..... |
| Oats, white.....do..... | 44 to 45 | 42 to ——— |
| No. 1, mixed .....do..... | 43 to ——— | 40 to ——— |
| Rye .....do..... | 91 to 93 | 90 to 92 |
| Barley, winter, No. 2.....do..... | 70 to 80 | 65 to 75 |
| spring, No. 2 .....do..... | 70 to 80 | 70 to 73 |
| Hay, tight-pressed, com. to choice ..per ton... | 16 00 to 23 00 | 16 00 to 23 00 |
| loose-pressed, prime to choice ....do..... | 17 00 to 21 00 | 17 00 to 21 00 |
| Pork, mess.....per barrel.. | 13 00 to 13 25 | 12 00 to ——— |
| prime.....do..... | ..... | ..... |
| Beef, plate.....do..... | 13 00 to ——— | 13 00 to 13 50 |
| hams.....do..... | 26 00 to 28 00 | 26 00 to 28 00 |
| Lard, prime, steam.....per pound.. | 9⅜ to 10½ | 8⅝ to ——— |
| Butter, western reserve .....do..... | 23 to 25 | 30 to 32 |
| choice central Ohio.....do..... | 21 to 23 | 25 to 28 |
| Tobacco, lugs .....do..... | 9 to 18 | 8 to 18 |
| leaf.....do..... | 9 to 30 | 9 to 30 |
| Wool, tub-washed .....do..... | 75 to 78 | 75 to 78 |
| fleece-washed, manufact'g.....do..... | 55 to 60 | 55 to 60 |
| fleece-washed, combing .....do..... | 55 to 60 | 55 to 60 |
| unwashed, manufacturing.....do..... | 45 to 48 | 45 to 48 |
| unwashed, combing.....do..... | 45 to 50 | 45 to 50 |
| pulled .....do..... | 72 to 75 | 72 to 75 |
| CHICAGO. | | |
| Flour, winter, extra .....per barrel.. | 7 25 to 9 00 | 8 50 to 9 00 |
| spring, extra .....do..... | 4 50 to 6 75 | 5 50 to 7 00 |
| Wheat, No. 1 spring.....per bushel.. | 1 31 to ——— | 1 28 to 1 30 |
| No. 2 spring .....do..... | 1 23¾ to 1 25 | 1 20 to 1 21 |
| No. 3 spring .....do..... | 1 18 to ——— | 1 15 to 1 16 |
| Corn, No. 2.....do..... | 37 to 39¼ | 38 to 39¼ |
| rejected .....do..... | ..... | ..... |
| Oats, No. 2 .....do..... | 31⅝ to 32 | 30⅝ to 30¾ |
| rejected .....do..... | 29 to ——— | ..... |
| Rye, No. 2 .....do..... | 73 to 75½ | 68 to 68½ |
| Barley, No. 2.....do..... | 56 to 66 | 50 to ——— |
| Hay, timothy, (on track).....per ton.. | 13 00 to 14 00 | 13 00 to 14 00 |
| prairie .....do..... | 9 00 to 10 50 | 9 00 to 10 00 |
| Pork, mess .....per barrel.. | 11 95 to 12 60 | 11 30 to 11 35 |
| extra.....do..... | 11 40 to 11 50 | ..... |
| Beef, mess .....do..... | 8 75 to 9 00 | 8 75 to 11 00 |
| Lard .....per pound.. | 8⅝ to ——— | 8⅛ to 8⅝ |
| Butter, choice dairy .....do..... | 25 to 27 | 25 to 27 |
| fair to choice tub and firkin ..do..... | 16 to 22 | 16 to 22 |

*Market prices of farm products*—Continued.

| Articles. | March. | April. |
|---|---|---|
| **CHICAGO—Continued.** | | |
| Cheese, New York factory ..... per pound | $0 17 to $0 17½ | $0 20 to $0 21 |
| western factory ..... do | 13 to 16 | 15 to 18 |
| Ohio factory ..... do | 16 to ——— | 18 to 19 |
| Wool, medium fleece ..... do | 60 to 66 | 62 to 68 |
| unwashed, medium ..... do | 38 to 45 | 40 to 50 |
| tub-washed ..... do | 79 to 82 | 63 to 85 |
| **SAINT LOUIS.** | | |
| Flour, superfine ..... per barrel | 5 75 to 6 00 | 5 50 to ——— |
| extra ..... do | 6 25 to 7 35 | 6 00 to 7 50 |
| choice ..... do | 8 10 to 8 75 | 8 00 to 8 85 |
| Wheat, red ..... per bushel | 1 65 to 1 79 | 1 70 to 1 90 |
| white ..... do | 1 65 to 1 75 | 1 78 to 1 97 |
| spring ..... do | 1 36 to 1 45 | 1 43 to 1 45 |
| Corn, mixed ..... do | 40 to 50 | 39 to 52⅓ |
| yellow ..... do | 39 to 51 | 40 to 51 |
| white ..... do | 55 to 58 | 46½ to 55 |
| Oats, white ..... do | 36 to 43½ | 37 to 43 |
| mixed ..... do | 36 to 42 | 34¾ to 41½ |
| Rye ..... do | 80 to 83 | 76 to 77 |
| Barley, winter ..... do | 70 to ——— | 60 to 80 |
| spring ..... do | 62½ to ——— | 50 to 61½ |
| Hay ..... per ton | 15 00 to 22 00 | 17 00 to 20 00 |
| Pork, mess ..... per barrel | 12 75 to 13 00 | 11 75 to 12 00 |
| Lard, prime steam ..... do | 8½ to 8¾ | ——— |
| kettle ..... do | 8½ to 8¾ | 8¼ to 9½ |
| Butter, choice ..... per pound | 22 to 35 | 24 to 40 |
| medium to fair ..... do | 15 to 22 | 15 to 24 |
| Cheese, choice factory ..... do | 16½ to 17 | 18½ to 22 |
| Cotton, middling ..... do | 21 to ——— | 22 to ——— |
| Tobacco, lug ..... per cwt | 4 20 to 10 75 | 6 80. to 8 25 |
| common leaf ..... do | ——— | 8 25 to 8 75 |
| medium to good leaf ..... do | ——— | 9 00 to 12 00 |
| Wool, tub-washed ..... per pound | 80 to 85 | 75 to 77 |
| fleece-washed ..... do | ——— | ——— |
| unwashed medium ..... do | 47½ to 50 | 45 to 47 |
| **NEW ORLEANS.** | | |
| Flour, superfine ..... per barrel | 6 62½ to ——— | 6 50 to ——— |
| extras, (according to grade) .... do | 7 50 to 11 50 | 7 25 to 11 00 |
| Corn, white ..... per bushel | 75 to 85 | 75 to 80 |
| yellow ..... do | 73 to 78 | 72 to 75 |
| mixed ..... do | 73 to 78 | 72 to 75 |
| Oats ..... do | 53 to 55 | 55 to 58 |
| Hay, choice ..... per ton | 31 00 to 32 50 | 37 00 to 40 00 |
| prime ..... do | 28 00 to 30 00 | 35 00 to ——— |
| Pork, mess ..... per barrel | 14 50 to 14 75 | 13 25 to ——— |
| Beef, mess, (Texas) ..... do | 11 00 to 12 00 | 11 00 to 12 00 |
| Lard, tierce ..... per pound | 9¼ to 9½ | 9¼ to 9½ |
| keg ..... do | 10 to 10½ | 9½ to 10¼ |
| Butter, choice western ..... do | 22 to 25 | 30 to ——— |
| Goshen ..... do | 34 to ——— | 40 to ——— |
| Cheese, choice factory ..... do | 17 to ——— | 19 to ——— |
| western reserve ..... do | 16 to ——— | 18 to ——— |
| New York cream ..... do | 18 to ——— | 20 to ——— |
| Cotton, ordinary to good ordinary .... do | 19 to 20⅜ | 18¼ to 21⅜ |
| middling to good middling .... do | 21⅜ to 22⅝ | 22¼ to 23¼ |
| Tobacco, lugs ..... do | 8 to 8¾ | 8 to 9 |
| low-leaf ..... do | 9 to 9½ | 9 to 9¼ |
| medium ..... do | 9½ to 10⅓ | 9¾ to 11 |

*Market prices of farm products*—Continued.

| Articles. | March. | April. |
|---|---|---|
| SAN FRANCISCO. | | |
| Flour, superfine ..... per barrel.. | $5 50 to ——— | $4 75 to ——— |
| extra super ..... do..... | 5 75 to $6 00 | 5 25 to $5 50 |
| higher grades ..... do..... | 6 25 to 6 50 | 5 75 to 6 25 |
| Wheat, State ..... per cental.. | 2 05 to 2 25 | 1 75 to 1 95 |
| Oregon ..... do..... | 2 15 to 2 25 | 1 85 to 1 95 |
| Corn, white ..... do..... | 2 10 to 2 15 | 1 50 to ——— |
| yellow ..... do..... | 1 75 to 1 80 | 1 45 to 1 50 |
| Hay, State ..... per ton.. | 14 50 to 23 50 | 15 00 to 22 50 |
| Pork, mess ..... per barrel.. | 15 00 to 17 50 | 17 00 to 18 00 |
| prime ..... do..... | 15 00 to 16 00 | 16 00 to 17 50 |
| Beef, mess ..... do..... | 13 50 to 22 00 | 12 00 to 22 00 |
| Lard ..... per pound.. | 11¾ to 13 | 11½ to 13 |
| Butter, overland ..... do..... | 20 to 25 | 20 to 22½ |
| California ..... do..... | 25 to 32½ | 20 to 25 |
| Oregon ..... do..... | 15 to 20 | 15 to ——— |
| Cheese ..... do..... | 18 to 20 | 16 to 22 |
| Wool, native ..... do..... | 30 to ——— | 35 to 40 |
| California ..... do..... | 35 to 45 | 45 to 55 |
| Oregon ..... do..... | 40 to 45 | 40 to 50 |